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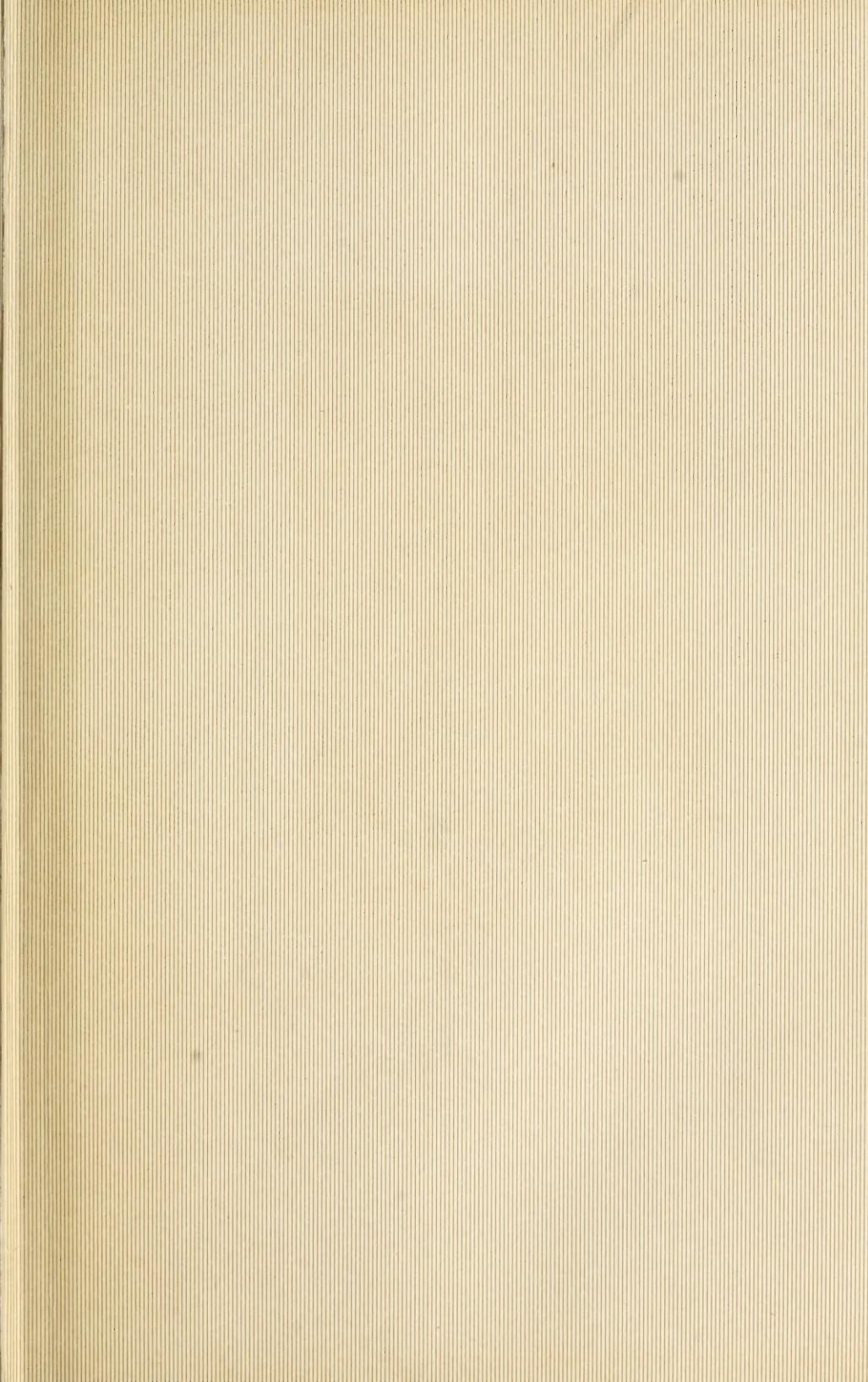


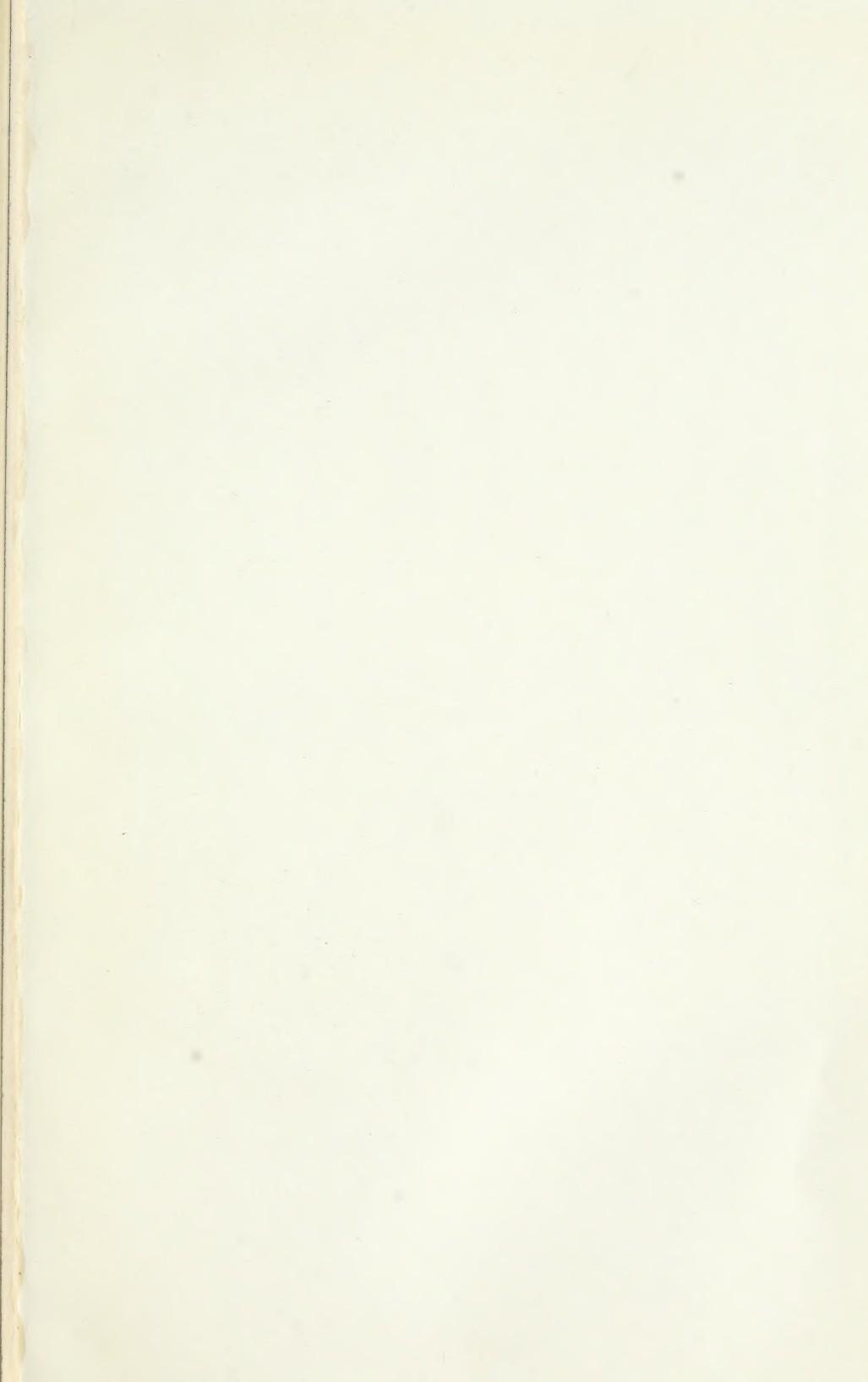


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CHICAGO

COLLIER'S
NEW
ENCYCLOPEDIA
A LOOSE-LEAF AND SELF-REVISING
REFERENCE WORK

IN TEN VOLUMES WITH SIX ILLUSTRATIONS
AND NINETY-SIX MAPS

Michigan Boulevard, Chicago, a beautiful avenue extending from the north end of Grant Park to Garfield Boulevard near Washington Park. This famous street was once an Indian trail.

VOLUME TWO

P. F. COLLIER & SON COMPANY
NEW YORK

COLLIER'S
NEW
ENCYCLOPEDIA
A LOOSE-LEAF AND SELF-REVISING
REFERENCE WORK

IN TEN VOLUMES WITH 505 ILLUSTRATIONS
AND NINETY-SIX MAPS



VOLUME TWO

P. F. COLLIER & SON COMPANY
New York

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“BERN—CIRCUMFERENCE”

BERNARD OF CLUNY, a French monk and poet who flourished in the 12th century, and is noted for his work "On Contempt of the World" (1597); but very little is known of the author's life.

BERNARDINE, the name given to the Cistercian monks, a branch of the old Benedictines, from St. Bernard, who, entering the order, gave it such an impulse that he was considered its second founder. His Order was revived in 1664 by Armand Jean Bouthelier de Rance, and long flourished under the name of the Reformed Bernardines of La Trappe.

BERNHARD, Duke of Saxe-Weimar, a German military officer, born in 1604. He entered the army, and early distinguished himself. He joined the army of Gustavus Adolphus, in 1631, in the war against the House of Austria. He took part in the siege of Würzburg, assisted at the passage of Oppenheim, took Mannheim, and drove the enemy from the Palatinate. He began the conquest of Bavaria, completed the victory of Lützen after the fall of Gustavus, and drove the Austrians from Saxony. He afterward had a command subordinate to Marshal Horn. He took Ratisbon, which was soon lost, and, with Horn, was defeated at Nördlingen, in September, 1634. Soon after he accepted a subsidy from the King of France, and concerted operations with Richelieu. In 1638 he won the battle of Rheinfeld, and took Alt-Breisach. He died in 1639.

BERNHARDI, FRIEDRICH VON, a German general and author, born Nov. 22, 1849. His early education was thorough, both in letters and in military science. His chief claim to eminence lies in a book written by him in 1911, entitled "Germany and the Next War." Its importance has been minimized by the Germans themselves, but after the actual outbreak of the World War, it was more widely quoted from than any other German work and was accepted by the Allied nations as the most perfect embodiment of the callousness and cynicism of the German military clique that provoked the conflict. Bernhardi's book was characterized by keenness and ingenuity, and the course of the war showed that it contained some elements of prophecy, notably in the violation of Belgian neutrality and the extensive employment of the submarine. Other books by him are "How Germany Makes War," "Cavalry," and on "War of To-Day," but none of them attained the importance of the first. During the World War he commanded an army corps on the Bel-

gian front, but never rose above mediocrity as a military leader.

BERNHARDT, ROSINE SARAH, a French actress, born in Paris, Oct. 22, 1844. At an early age her Jewish parents placed her in a convent at Versailles. When 14 years old she left the convent, and entered the Paris Conservatoire. In 1862 she made her debut at the Théâtre Français, in Racine's "Iphigène" and Scribe's "Valerie," but, not



SARAH BERNHARDT

achieving a success, she retired for a time from the stage. Her first great success was as *Marie de Neuberg*, in Victor Hugo's "Ruy Blas," in January, 1867. Becoming very popular by her representations, notably in "Andromaque" and "La Sphinx," she was recalled to the Français, and was soon recognized as the foremost actress in French tragedy. In 1879 she visited London with the company of the Comédie Française and was warmly received; in 1880, 1887, 1891, 1896, 1900, 1911 and 1913 she made successful appearances in the United States, and visited Switzerland, Holland, South America, Italy, Algeria, Australia, etc. In 1899 she appeared in a new rendering of

Hamlet in Paris. Her most successful rôles were *Theodora*, *Fedora*, *La Tosca* and *Cleopatra*. She exhibited at the Paris Salon sculpture and painting and wrote two plays, "L'Aveu" (1888), and "Adrienne Lecouvreur" (1907). She was made a member of the Legion of Honor in 1916.

BERNINA, a mountain of the Rhætian Alps, 13,290 feet high, in the Swiss canton of Grisons, with remarkable and extensive glaciers. Its summit was first attained in 1850. The Bernina Pass, which attains an elevation of 7,642 feet, and over which a carriage road was completed in 1864, leads from Pontresina to Poschiavo.

BERNOUILLI, or **BERNOULLI** (ber-nö-yē), a family which produced eight distinguished men of science. The family fled from Antwerp during the Alva administration, going first to Frankfort, and afterward to Basel. 1. JAMES, born in Basel in 1654, became professor of mathematics there 1687, and died 1705. He applied the differential calculus to difficult questions of geometry and mechanics; calculated the loxodromic and catenary curve, the logarithmic spirals, the evolutes of several curved lines, and discovered the so-called numbers of Bernouilli. 2. JOHN, born in Basel, in 1667, wrote with his brother, James, a treatise on the differential calculus; developed the integral calculus, and discovered, independently of Leibnitz, the exponential calculus. In 1694 he became Doctor of Medicine in Basel, and in 1695 went, as Professor of Mathematics, to Groningen. After the death of his brother he received the professorship of mathematics in Basel, which he held until his death in 1748. 3. NICHOLAS, nephew of the former, born in Basel in 1687; in 1705 went to Groningen to John Bernouilli, and, returning with him to Basel, became there professor of mathematics. On the recommendation of Leibnitz he went as professor of mathematics to Padua in 1716, but returned to Basel in 1722 as professor of logic, and in 1731 became professor of Roman and feudal law. He died in 1759. The three following were sons of the above mentioned John Bernouilli: 4. NICHOLAS, born in Basel, in 1695, became professor of law there in 1723, and died in St. Petersburg in 1726. 5. DANIEL, born at Groningen in 1700; studied medicine. At the age of 21 he went to St. Petersburg, returning in 1733 to Basel, where he became professor of anatomy and botany, and in 1750 professor of natural philosophy. He retired in 1777, and died in 1782. 6. JOHN, born in Basel in 1710, went to St. Peters-

burg in 1732, became professor of rhetoric in Basel in 1743, and in 1748 professor of mathematics. He died in 1790. The two following were his sons: 7. JOHN, licentiate of law and royal astronomer in Berlin, born in Basel in 1744. He lived after 1799 in Berlin as Director of the Mathematical Department of the Academy. He died in 1807. 8. JAMES, born at Basel in 1759; went to St. Petersburg, where he became professor of mathematics; married a granddaughter of Euler, and died in 1789 while bathing in the Neva.

BERNSTEIN, HERMAN, an author born in Neustadt-Scherwindt, Poland, 1876; came to the United States in 1893. From 1908 to 1912 he traveled in various countries of Europe as correspondent of the New York "Times," securing interviews with notables, especially one with Tolstoi that attracted wide attention. In 1915 he again visited Europe to investigate the condition of the Jews in the war-stricken countries of eastern Europe. From Russia in 1917 he secured the "Willy-Nicky" correspondence between the Kaiser and the Czar. He was editor-in-chief of the "American Hebrew" from 1916.

BERNSTORFF, JOHANN HEINRICH A., COUNT VON, German diplomat; born in London, England, Nov. 14, 1862. His father at the time was the German Ambassador to England. The son received his early education in that country, and became thoroughly familiar with English thought and diplomatic procedure. He entered the German army in the artillery arm in 1881. His diplomatic career began in 1889, when he was made attaché of the German Embassy at Constantinople. After a period of service in the Foreign Office at Berlin, he was made Secretary of Legation at Belgrade in 1892, at Dresden in 1894, in St. Petersburg, 1896, and in Munich in 1898. Four years later, he was adviser to the Embassy in London, and in 1906 was made Consul-General in Egypt. On the 14th of November, 1908, he was appointed Ambassador to the United States, an office which he still held at the outbreak of the World War. From the beginning of the conflict he was active in spreading pro-German propaganda. This, as long as he kept within the limits of diplomatic ethics, was permissible. But he far overstepped these bounds and before long the German Embassy at Washington was the center of a web of intrigue and sabotage that spread all over the United States. Mysterious fires broke out in plants that were making munitions for the Allies, bridges were

blown up, infernal machines were placed in the holds of outgoing steamers, explosions and wrecks took place in shipyards, strikes were instigated without apparent reason, and American public opinion grew steadily more exasperated. The intention to sink the "Lusitania" was evidently known to Bernstorff in advance, as prior to the vessel's sailing he inserted a warning in American papers against taking passage on the liner, a warning that was arrogant and unprecedented, and aroused great resentment on the part of the American Government and people. The end of Bernstorff's American career came with the declaration by the German Government that it was about to inaugurate a campaign of ruthless submarine warfare. This declaration was issued on Jan. 31, 1917, and on February 3 Count von Bernstorff received his passports. On February 5 the German Emperor conferred upon him the Iron Cross of the White Ribbon for his services. During the war he was employed in various diplomatic services in Berlin. He gave important and interesting testimony in 1919 before the Reichstag Committee that was investigating the conduct of the war, in which he declared that he had opposed the inauguration of unrestricted submarine warfare, but that his efforts to keep America from participating in the war had been frustrated by the obtuseness of the German Government.

In 1920 the ex-Ambassador published a book, entitled: "My Three Years in America," which contained many facts that had not previously been made public and that were of exceptional historical interest. In this he denied in toto the intrigues of the German Embassy leading to crimes in this country.

BEROSUS, a genus of beetles belonging to the family *hydrphilidae*. They have prominent eyes, a narrow thorax, a dusky yellow hue, with dark metallic bronze markings. They swim in ponds, often in an inverted position.

BERQUIN, LOUIS DE (ber-kan'), the first Protestant martyr in France, born in 1490. He was a gentleman of Artois, a friend of Badius, the savant. When, in 1523, the police began to seize Luther's works, with a view to suppressing Protestantism, they found among Berquin's books some manuscripts of his own writing that were pronounced heretical. As he refused to retract, he was thrown into prison. Francis I., whose counselor he was, obtained for him his freedom; and Erasmus, always his friend, tried in vain to prevent him from exposing his life in a useless

struggle. He was burned alive in Paris, April 17, 1529.

BERRI, or BERRY, CHARLES FERDINAND, DUKE OF, second son of the Count d'Artois (afterward Charles X.), born at Versailles, Jan. 24, 1778. In 1792 he fled with his father to Turin and served under him and Condé on the Rhine. In 1801 he went to Great Britain, and planned for the restoration of the Bourbons. In 1814 he landed at Cherbourg, and passed on to Paris, gaining many adherents to the royal cause; but they melted away when Napoleon landed from Elba, and the Count was compelled to retire to Ghent and Alost. After Waterloo he returned to Paris, and in 1816 married. He was assassinated by Louvel, a political fanatic, Feb. 14, 1820. The Duke had by his wife, Carolina Fernandina Louisa, eldest daughter of Francis, afterward King of the Two Sicilies, a daughter, Louise Marie Thérèse, afterward Duchess of Parma, and a posthumous son, Comte de Chambord.

BERRY, a succulent fruit, in which the seeds are immersed in a pulpy mass inclosed by a thin skin. Popularly it is applied to fruits like the strawberry, bearing external seeds on a pulpy receptacle, but not strictly berries.

BERRY, CANAL DE, one of the most important canals in France as regards the amount of its traffic; begins at Montluçon on the Cher, the chief trading center of the coal fields of the Allier; descends the Cher valley to St. Armand, then proceeds E., and soon after branches, one branch going N. E. and joining the lateral canal of the Loire about 9 miles N. W. of Nevers, the other branch proceeding N. and rejoining the valley of the Cher, and ultimately entering the Cher itself near St. Aignan, below which point the canalized Cher continues the line of navigation to Tours. Length of navigation 200 miles, of which 36½ miles belong to the canalized Cher. Constructed 1807-1841.

BERSAGLIERI (ber-sal-yā'-rē), a corps of riflemen or sharpshooters, introduced into the Sardinian army by Gen. Della Marmora, about 1849. They took part in the Russian War and also assisted at the battle of the Tchernaya, Aug. 16, 1855. They were likewise employed in the Italian Wars of 1859 and 1866, and in the World War, where they performed heroic service.

BERSERKER, a redoubtable hero, the grandson of the eight-handed Starkader and the beautiful Alfhilde. He despised mail and helmet, and, contrary to the

custom of his time, went always into battle unharnessed, his fury serving him instead of defensive armor. By the daughter of King Swafurlam, whom he had slain in battle, he had 12 sons, who inherited the name of Berserker along with his warlike spirit.

BERTHA, the name of several famous women of the Middle Ages, half historical, half fabulous. ST. BERTHA, whose day is kept on July 4, was the beautiful and pious daughter of Charibert, King of the Franks, who, having married (560 A. D.) Æthelbert, King of Kent, became the means of his conversion, and of the spread of Christianity among the Anglo-Saxons. In the romances of the Charlemagne cycle, there figures a BERTHA, called also Berthrada with the Big Foot, as the daughter of Count Charibert of Laon, wife of Pepin the Little and mother of Charlemagne. In the romances of the "Round Table," again, BERTHA is the name of a sister of Charlemagne, who makes Milo d'Anglesis the father of Roland. Better known is BERTHA, daughter of Burkhard, Duke of the Allemanni, and wife of Rudolf II., King of Burgundy beyond Jura, who, after Rudolf's death (937), acted as regent for her infant son, Konrad; she afterward married Hugo, King of Italy; and died toward the close of the 10th century.

BERTHELOT, PIERRE EUGÈNE MARCELLIN (ber-tel'-ō'), a French chemist, born in Paris, Oct. 25, 1827; early studied chemistry, and in 1859 was appointed Professor of Organic Chemistry in the Superior School of Pharmacy. In 1865 a new chair of organic chemistry was organized for him in the College of France. In 1870 he was elected president of the scientific committee of defense, and during the siege of Paris was intrusted with the manufacture of ammunition and guns, and especially dynamite and nitro-glycerine. In 1878 he became president of the committee on explosives, which introduced smokeless powder. His labors also led to the discovery of dyes extracted from coal tar. He received the decoration of the Legion of Honor in 1861; Commander in 1879, and Grand Officer in 1886. In 1889 he was elected Permanent Secretary of the Academy of Sciences. His works include "Chimie organique fondée sur la synthèse" (1860); "Leçons sur les principes sucrés" (1862); "Leçons sur l'Iso-mérie" (1865); "Traité élémentaire de chimie organique" and "Sur la force de la poudre et des matières explosives" (1872-1889); "Les Origines de l'alchimie" (1885); "Collection des anciens

alchimistes grecs" (1888); "Chimie des anciens" (1889); etc. He died March 18, 1907.

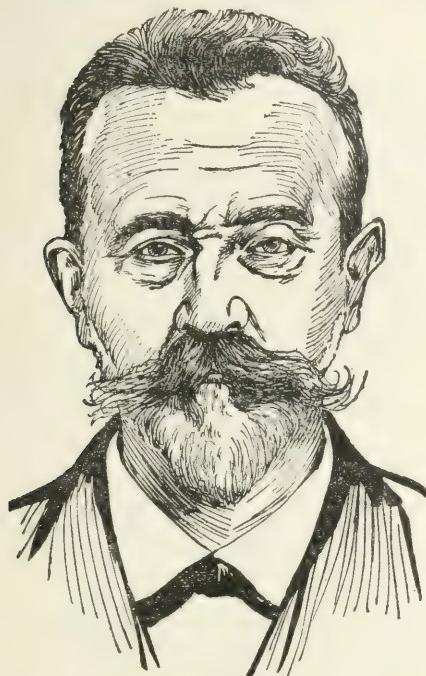
BERTHIER, ALEXANDRE (bert-yā'), Prince of Neuchâtel and Wagram, born in Versailles in 1753. He served as officer of a regiment of dragoons in the American Revolutionary War. During the French Revolution he became commandant of the National Guard at Versailles, and exerted himself to check the excesses of the populace. During the Reign of Terror he served under Lafayette, and afterward under Bonaparte, in his first Italian campaign. From this time he accompanied Napoleon in all his campaigns as chief of staff. In 1803 he married a Bavarian princess. In 1805 he was created a marshal of the empire, grand huntsman of the empire, and chief of the first cohort of the Legion of Honor. In 1806 he became Prince of Neuchâtel, and in 1809 Prince of Wagram. In 1810 he officiated as Napoleon's proxy in the marriage of Maria Louisa. On the restoration of Louis XVIII. he accepted the situation of captain of one of the companies of the gardes-de-corps. On the return of Napoleon he retired to Bamberg, where he died March 20, 1815.

BERTHOLLET (ber-tōl-ā'), **CLAUDE LOUIS, COUNT**, a French chemist, was born in Savoy, Dec. 9, 1748, and studied medicine at Turin. He afterward settled in Paris, was admitted a member of the Academy of Sciences, and made a professor at the Normal School. He accompanied Napoleon to Egypt; and, during the empire, was made a Senator and an officer of the Legion of Honor. He deserted his patron in the days of misfortune and received the title of Count from Louis XVIII. His principal work is "Essai de statique chimique" (1803). He died Nov. 6, 1822.

BERTHOLLETIA, named after Count Berthollet, a genus of plants belonging to the order *lecythidaceæ*. The only species is a large tree, growing 100 feet high, with a diameter of two feet, found in the forests which fringe the Orinoco. It has yellowish white flowers. The fruit is the size of a man's head, with four cells and six or eight nuts. These are called Brazil, or, from the place where they are shipped, Para nuts. They are eatable and furnish a bland oil used by watchmakers and artists. At Para the fibrous bark of the tree is used in place of oakum.

BERTILLON, ALPHONSE (ber-tē-yōn'), a French anthropologist, born in Paris in 1853; is widely noted as the

founder of a system of identification of criminals. In 1880, while Chief of the Bureau of Identification in the Prefecture of Police, he established his system of measurements which has given results



ALPHONSE BERTILLON

marvelous for their precision. The system has since been adopted by the police authorities of the large cities of Europe and the United States. He was author of numerous works bearing upon his system, including "Identification anthropometrique" (1893).

BERTILLON SYSTEM, a system of identification of criminals, introduced into France by Alphonse Bertillon. The system depends upon accurate measurements of various portions of the human body, especially the bones, which in adults never change. The parts measured are the head, ear, foot, middle finger, the extended forearm, height, breadth, and the trunk. These measurements are placed upon a card, and, together with photographs of the bodily features, take the place of the old portraits in the rogues' gallery. The system has been highly developed, and is now an important feature of the police department of every large city in the world.

BERTRAND (ber-trän'), HENRI GRATIEN, COUNT, a French military

officer, born in Châteaurox in 1773, and early entered the armies of the Revolution as engineer. He accompanied the expedition to Egypt, and directed the fortification of Alexandria. He distinguished himself at Austerlitz, and became Napoleon's adjutant; and, after the battle of Aspern, in 1809, for his share in saving the French army by bridges, he was created count and governor of Illyria. He retired with the Emperor to Elba, was his confidant in carrying out his return to France, and finally shared his banishment to St. Helena. On Napoleon's death, Bertrand returned to France, where he was restored to all his dignities, and, in 1830, appointed Commandant of the Polytechnic School. He died in Châteaurox, Jan. 31, 1844.

BERWICK, a borough of Pennsylvania, in Columbia co. It is on the Delaware, Lackawanna and Western railroad and on the Susquehanna river. The industries include iron works, silk manufactures, and manufactures of pipes, caskets, and pottery. Pop. (1910) 5,357; (1920) 12,181.

BERWICK, or more fully, **BERWICK-ON-TWEED**, a seaport town of England, formerly a Parliamentary borough, but now incorporated with Northumberland, and giving name to a Parliamentary division of the county. It stands on the N. or Scottish side of the Tweed. It is surrounded by walls of earth faced with stone, along which is an agreeable promenade. The Tweed is crossed by an old bridge of 15 arches and by a fine railway viaduct. The chief industries are iron founding, the manufacture of engines and boilers, agricultural implements, feeding cake, manures, ropes, twine, etc.; there is a small shipping trade. In the beginning of the 12th century, during the reign of Alexander I., Berwick was part of Scotland, and the capital of the district called Lothian. In 1216 the town and castle were stormed and taken by King John; Bruce retook them in 1318; but, after undergoing various sieges and vicissitudes, both were surrendered to Edward IV. in 1482, and have ever since remained in possession of England. Pop. about 15,000.

BERWICK, JAMES FITZJAMES, DUKE OF, born in 1670; was a natural son of James II., King of England, and Arabella Churchill, sister of the Duke of Marlborough. His first military service was under Charles, Duke of Lorraine, in Hungary, and he was present at the siege of Buda, and the battle of Mohacz. He was created Duke of Berwick in 1687; accompanied James II. to France, at the Revolution, served under him in Ire-

land, and was at the battle of the Boyne. He became Lieutenant-General in the French army, was naturalized in France, afterward commanded in Spain, and by the victory of Almanza secured the throne to Philip V. He especially distinguished himself by the defense of Provence and Dauphiné, in 1709, against the superior forces of the Duke of Savoy. He was killed at the siege of Philipsburg, in 1734.

BERWYN, a city of Illinois, in Cook co. It is on the Chicago, Burlington and Quincy and the Illinois Central railroads. The city is entirely residential. Pop. (1910) 5,841; (1920) 14,150.

BERYL, a colorless, yellowish, bluish or less brilliant green variety of emerald, the prevailing hue being green of various shades, but always pale. The best beryls are found in Brazil, in Siberia, and Ceylon, and in Dauria, on the frontiers of China. Beryls are also found in many parts of the United States. Some of the finer and transparent varieties of it are often called aquamarine.

BERYLLIUM, a rarer white malleable metal, the same as glucinum. It occurs as a silicate in phenacite, also in the mineral beryl along with aluminum silicate.

BERZELIUS, JOHANN JAKOB, BARON, a Swedish chemist, born in Ostgothland, Aug. 29, 1779. After graduating at Upsala, in 1804, he went to Stockholm, where he became an assistant to Sparrmann, who had accompanied Captain Cook in one of his voyages around the world; and at his death, in 1806, he succeeded him in the chair of chemistry, which he held for 42 years. His patient labors and ingenious investigations have done more to lay the foundations of organic chemistry than those of any other chemist. To him, chemistry is indebted for the discovery of several new elementary bodies, more especially selenium, thorium, and cerium; and to his skill as a manipulator may be traced many of the analytical processes at present in use. All the scientific societies of the world contended for the honor of enrolling his name among their members. He died in Stockholm, Aug. 7, 1848.

BESANCON (bes-äñ-sôñ'), a city in the N. E. of France, the capital of the department of Doubs, on the river Doubs. It commands a strong strategic position at the convergence of the roads from Switzerland and the valley between the Vosges and Jura Mountains. It was the fortified town of Vesontio in

58 B. C., when Caesar expelled the Segani. In the 5th century it was part of Burgundy, and in 1032 a free city of Franche-Comté. By the peace of Westphalia, in 1648, it was ceded to Spain, but was retaken by Louis XIV., united to France in 1678, and fortified by Vauban. It withstood the Austrians in 1814, and was the seat of operations of the French army under Bourbaki in 1870-1871. It contains Roman remains, including an amphitheater, aqueduct and triumphal arch of Mars, as well as a cathedral of diversified architectural style, and the Renaissance palace of Cardinal Granvella, who was born in Besançon. Victor Hugo was also a native of Besançon. Watchmaking is the principal industry. Pop. about 60,000.

BESANT, ANNIE (bes'ant), an English theosophist and author, born in London, Oct. 1, 1847; was married in 1867 to the Rev. Frank Besant, brother of Sir Walter Besant, but was legally separated from him in 1873. She manifested an earnest interest in social and political topics, and, in 1874, became connected with the National Secular Society. Owing to the publication of "Fruits of Philosophy," Mrs. Besant was prosecuted, in connection with Charles Bradlaugh (June, 1877), but the prosecution failed. In 1883 she announced her adhesion to Socialism. For three years she was a member of the School Board of London. She was prominently connected with various socialistic movements, and in 1889 joined the Theosophical Society, of which she became president in 1907. She visited the United States in 1891 and 1892-1893 and lectured on Madame Blavatsky and reincarnation, theosophy, and occultism. Among her numerous publications are "Reincarnation" (1892); "Autobiography" (1893); "Death and After" (1893); "Building of the Kosmos" (1894); "The Self and Its Sheaths" (1895); "Path of Discipleship" (1896); "Four Great Religions" (1897); "The Ancient Wisdom" (1897); "Three Paths to Union with God" (1897); etc.

BESANT, SIR WALTER (bes-ant'), an English novelist, born in Portsmouth, Aug. 14, 1836. After graduation at Cambridge, he went to Mauritius as professor in the Royal College, but returned to London, where he long was secretary of the Palestine Exploration Fund. In 1871 he formed a literary partnership with James Rice, which continued until the death of the latter. Among their novels are "Ready Money Mortiboy" (London, 1871); "The Golden Butterfly" (1876); "The Seamy Side" (1881); and

"The Chaplain of the Fleet" (1881). Alone he wrote "Studies in Early French Poetry" (1868); "The French Humorists" (1873); "All Sorts and Conditions of Men" (1882), "All in a Garden Fair" (1883); "Dorothy Foster" (1884); "Amorel of Lyonesse" (1890); "St. Katharine's by the Tower" (1891); "The Ivory Gate" (1892); "Beyond the Dreams of Avarice"; "The Master Craftsman"; "The Pen and the Book"; "The Alabaster Box" (1900); etc. He died June 9, 1901.

BESIKA BAY, a bay on the N. W. coast of Asia Minor, opposite Tenedos, to the S. of the entrance of the Dardanelles. The English fleet was stationed here during crises in the Eastern question in 1853-1854 and 1877-1878.

BESSARABIA, a former province of the Russian Empire between the Pruth, the Danube, and the Dniester. It stretches from Galicia southerly toward the Black Sea and is bounded by Dobrudja on the S., Moldavia on the S. W. and W., and by Podolia and Kherson on the N. and E. The area is 17,143 square miles. There is a conglomerate population, consisting of Rumanians, Russians, Poles, Armenians, Jews, and Greeks. The country is agricultural and the sowing and harvesting of crops employs the energies of over two million of the people. The capital is Kishinev. When Rumania was conquered by the Central Powers and forced to subscribe to the humiliating peace of Bucharest, she was permitted as a compensation for her territorial losses to annex Bessarabia. The purpose of Germany at the time was to hasten still further the disintegration of Russia. When, however, Germany was defeated and the treaty of Bucharest annulled the question was thrown open and brought before the peace conference for consideration. It was argued by the Bessarabian advocates of nationality that the annexation was unjustified and imperialistic and contrary to the principle of the self-determination of peoples. It was claimed on behalf of the Rumanians that the bulk of the Bessarabian people favored union with Rumania, and this seemed to be borne out by the elections at the close of 1919 in which the successful candidates were chosen on the platform of union. The province was finally allotted to Rumania by the Peace Conference. Pop. about 2,700,000.

BESSARION, JOHN, a Greek scholar, born in Trebizond in 1395, one of the most eminent restorers of learning in the 15th century, and founder of the

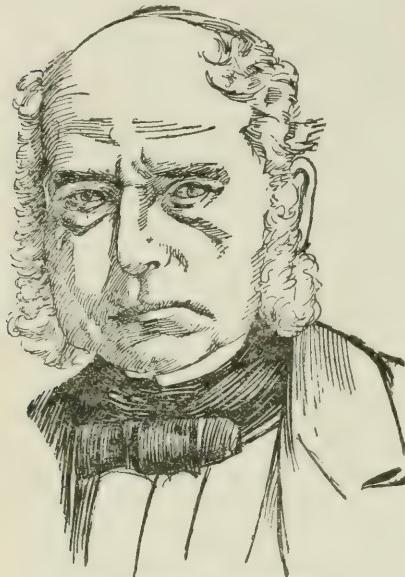
library of St. Mark at Venice; was a monk of the Order of St. Basil. He was drawn from his monastery in the Peloponnesus, to accompany the Emperor John Palæologus to the great council of Florence, where he effected, 1439, a union of short duration between the Greek and Roman Churches. He was made a Cardinal by Pope Eugenius, and had afterward the title of Patriarch of Constantinople given him by Pius II. He spent the last 30 years of his life at Rome, devoting himself to the promotion of literature, and discharging several important embassies. He wrote a work in defense of Platonic philosophy. He died in Ravenna, Nov. 19, 1472.

BESSEL, FRIEDRICH WILHELM, astronomer, born in Minden, Prussia, July 22, 1784. After some experience as an assistant in Schröter's observatory, he was appointed director of the new observatory at Königsberg. He first developed the theory of correcting for instrumental sources of error in all kinds of observations, and almost all the improvements in astronomical accuracy since his time have been only the further carrying out of his ideas. His investigations into the length of the seconds pendulum and that of standards of length were of the highest importance. The later years of his life were largely taken up with this subject of the general connection of all the European triangulations into one consistent system. He died in Königsberg, March 17, 1846.

BESSEMER, a town in Jefferson co., Ala.; on several trunk railroads; 11 miles S. W. of Birmingham, the county-seat. It was founded in 1887 as a manufacturing place because of the valuable iron and coal mines in its immediate vicinity. It contains iron foundries, coke ovens, a number of blast furnaces, machine shops, planing mills, iron pipe works, fire brick works and other works connected with the iron and steel industry. The city has a savings bank, several daily and weekly newspapers, library, hospital and other public buildings. Pop. (1910) 10,864; (1920) 18,674.

BESSEMER, city and county-seat of Gogebic co., Mich., on the Chicago and Northwestern and several other railroads; 40 miles E. of Ashland, Wis. It is in an important iron mining region; was founded in 1884, and has become important by reason of its mining and manufacturing and its trade relations with the surrounding territory. It has a notably fine high school building, courthouse, a National bank, and weekly newspapers. Pop. (1910) 4,583; (1920) 5,482.

BESSEMER, SIR HENRY, an English inventor, born in Charlton, Hertfordshire, Jan. 19, 1813; began modeling and designing patterns when 18 years old; chose engineering as a profession, and, after long and costly experiments, announced, in 1856, his discovery of a



SIR HENRY BESSEMER

means of rapidly and cheaply converting pig iron into steel, by blowing a blast of air through the iron when in a state of fusion (see **BESSEMER STEEL**). For this discovery the Institution of Civil Engineers awarded him the Gold Telford Medal, and several foreign governments honored him with valuable tokens. In the United States appreciation of his great discovery took the form of creating industrial cities and towns under his name. He was elected President of the Iron and Steel Institute of Great Britain in 1871; knighted by the Queen in 1879, and received the freedom of the city of London in 1880. He died in London, March 15, 1898.

BESSEMER STEEL, steel made from pig iron, from which practically all the carbon, etc., has been removed by exposing the molten mass to a current of air. The Bessemer process, that of Sir Henry Bessemer was patented in 1856. Bessemer's first idea was to blow air through molten pig iron till practically the whole of the carbon was oxidized when malleable iron was required, and to stop the blowing when a sufficient degree of decarburization was effected in

order to produce steel. By this process, steel has been produced ranging from 1.00 per cent. carbon to .08 per cent. carbon, the former being a steel suitable for springs, and the latter a soft material replacing wrought iron, rail steel usually containing .4 to .5 per cent. carbon.

The production of Bessemer steel in the U. S. in 1918 was 9,376,236 long tons, compared with a production of 10,479,960 tons in 1917.

BESSEY, CHARLES EDWIN, an American botanist, born in Milton, O., May 21, 1845; educated at Harvard University; Professor of Botany in the Iowa Agricultural College in 1870-1884; Professor of Botany in the University of Nebraska since 1884. He was also President of the Society for the Promotion of Agricultural Science in 1883-1885; President of the Nebraska Academy of Sciences in 1891; acting Chancellor of the University of Nebraska in 1888-1891; Fellow of the American Association for the Advancement of Science. His publications include "Reports on Insects" (1873-1874); "Geography of Iowa" (1876); "The Erysiphei of North America" (1877); "Botany for High Schools and Colleges" (1880); "Essentials of Botany" (1884); "Elementary Botany" (1904); "Synopsis of Plant Phyla" (1907); "Outlines of Plant Phyla" (1909), with others. "New Elementary Agriculture" (1911). He died in 1915.

BEST, WILLIAM THOMAS, an English musician, born in Carlisle, Aug. 13, 1826; received his musical training from Mr. Young, the organist of the Carlisle Cathedral. In 1848 he was appointed organist of the Philharmonic Society in Liverpool; in 1852 he went to London and became organist of the Panoptican of Science and Art, and also of the Church of St. Martin-in-the-Fields; in 1854 was organist of Lincoln's Inn Chapel; in 1855, returned to Liverpool, and became organist of St. George's Hall; in 1868 was organist of the Liverpool Musical Society; and in 1872 was again engaged by the Philharmonic Society. He was the author of "The Modern School for the Organ" (1853); "The Art of Organ Playing" (1870); "Arrangements from the Scores of the Great Masters" (1873); "The Organ Student," etc. He died in Liverpool, May 10, 1897.

BESTIARY, the name given to a class of written books of great popularity in the Middle Ages, describing all the animals of creation, real or fabled, composed partly in prose, partly in verse, and generally illustrated by drawings. But they were valuable for the moral

allegories they contained, no less than as handbooks of zoölogical facts. The oldest Latin bestiaries had an early Greek original, the well known "Physiologus," under which name about 50 such allegories were grouped. The Greek text of this famous work is found only in manuscript. There are old Syriac, Armenian, Ethiopic, Arabic, Icelandic, and numerous Latin versions. Editions of the Latin have been issued—Mai, Heider, and Cahier. An Old High German version was made earlier than the 11th century; in the 12th century, versions in French were made by Philippe de Thaun and Guillaume, a priest of Normandy. The "Bestiary of Love" of Richard de Fournival was rather a parody upon the earlier form of such books.

BETEL, or **BETLE**, the English name of the piper betle, a shrubby plant with evergreen leaves, belonging to the typical genus of the order *piperaceæ* (pepperworts). It is extensively cultivated in the East Indies. Its leaf is used as a wrapper to inclose a few slices of the areca palm nut with a little shell lime. The southern Asiatics are perpetually chewing it to sweeten the breath, to strengthen the stomach, and, if hunger be present, to deaden its cravings. It is called *pan*, or *pan sooparee*.

BETELGEUSE, the name given to a fixed star of the Orion constellation, also known as the Alpha Orionis, whose diameter, according to measurements made by Professor Albert A. Michelson, of Chicago University, is slightly more than three hundred times that of the sun, and nearly as large as that of the orbit of the planet Mars. Professor Michelson, in 1920, by means of a device for determining the actual diametrical size of a star, calculated that of Betelgeuse to be 260,000,000 miles. Compared with the sun in volume, this makes it 27,000,000 times as great, and if it could be placed as near to the earth as the sun, the planet would embrace the entire visible heavens. It is computed that it would take trillions of globes like the earth to equal Betelgeuse in size. The distance of this star from the earth is perhaps 150 "light" years, that is, the light which strikes the eye in looking up at Betelgeuse started on its journey from the star at the rate of 186,000 miles a second 150 years ago (from 1920). By Professor Michelson's device, it is believed that measurements of planets lost in space with invisible disks can be accurately determined with the aid of a simple formula. Astronomers incline to the opinion that other fixed stars, seemingly small by reason of their distance from the earth, are also vastly larger

than the sun. The dimension created to Betelgeuse, indeed, presents the conception of celestial bodies of magnitudes hitherto unmeasured and almost beyond comprehension.

The size of Betelgeuse was determined by combining its approximate distance from the earth, which was known, and its angular diameter, which had to be ascertained by Professor Michelson. Angular diameter is not the same as real or linear diameter. In the case of a star it has to be known before the real diameter can be calculated. The angular diameter of any object (say a house) varies according to the distance from which it is viewed; the real or linear diameter remains the same, no matter at what varying distances a spectator sees it. Only the angular diameter (or the apparent diameter) is changed by the spectator changing his distance, and the farther off he stands the smaller the angular diameter becomes. The distance of Betelgeuse from the earth is approximately 1,070 trillion miles, from which dim point in the firmament is showed an angular diameter of 0.046 seconds, *i. e.*, 46/1,000 of a second of arc, or, say, for round numbers, 1/20 of a second. The magnitude of this exceedingly small angle can be appreciated by the fact that it is roughly equal to that which would be shown by a pinhead at a distance of more than a thousand miles. To put an angular diameter of 1/20 of a second into miles, Professor Michelson had to combine it with the known distance of the star in miles, remembering that since an angular diameter of one second corresponds to a distance of 206,000 times the actual or linear distance of the object, an angular diameter of only 1/20 of a second must correspond to a distance of about 4,120,000 times the object's real diameter. The actual diameter of Betelgeuse was thus found to be approximately 260,000,000 miles by dividing the 1,070 trillions (the star's distance) by 4,120,000. This measurement could not be made by direct observation. The smallness of the star's image not only rendered such a measurement impracticable, but such effects as irradiation and twinkling obscured the star's definition and blended the edge of the image with the diffraction rings surrounding it. These obstacles have been overcome by the use of the "interferometer," a device whose feature is parallel and movable slits of known distances separating them in a screen covering the viewing lens. By manipulating the slits the star's light becomes shed of the fringes, or interference bands, which appear when the instrument is focused on the star. As the slits are moved apart the fringes

become finer and finer, and with their disappearance the angular distance of the source of light becomes ascertainable. In the apparatus used by Professor Michelson he substituted a system of reflecting mirrors for the slits, thus obtaining better results.

BETHAM-EDWARDS, MATILDA, an English author, born in Suffolk, in 1836; was educated privately; has published numerous works in poetry, fiction, and on French rural life. She was made an officer of public instruction in France in 1891. Among her works are "The White House by the Sea," "Kitty," "France of To-Day," "A Romance of Dijon," "The Lord of the Harvest," a volume of poems, "East of Paris" (1902); "Home Life in France" (1905); "French Men, Women, and Books" (1910).

BETHANIA, or BETHANY a town in Syria, about 2 miles S. E. of Jerusalem, on the way to Jericho. It is now a small place, inhabited by a few Turkish families, by whom it is called Lazaris, in memory of Lazarus. The inhabitants show the pretended sites of the houses of Lazarus, of Martha, of Simon the leper, and of Mary Magdalene.

BETHANY COLLEGE, a coeducational institution in Bethany, W. Va., organized in 1841; under the auspices of the Church of the Disciples; reported at the end of 1919: Professors and instructors, 29; students, 500; president, T. E. Cramblet, A. M.

BETHEL, a town of Palestine, about 10 miles from Jerusalem, now called Beitin, or Beiteen. The patriarch Jacob here had a vision of angels, in commemoration of which he built an altar. Interesting ruins abound in the vicinity.

BETHEL COLLEGE, an educational institution in Russellville, Ky.; organized in 1854; under the auspices of the Baptist Church; reported at the end of 1919: Professors and instructors 12; students, 263; president, G. F. Dasher.

BETHESDA, a pool in Jerusalem, near St. Stephen's Gate, and the Temple of Omar. It is 400 feet long, 130 broad, and 75 deep, and is now known as Birket Israel (see John v: 2-9).

BETHLEHEM, a borough in Northampton co., Pa.; on the Lehigh river and canal, and the Lehigh Valley, the Central of New Jersey, and other railroads; 57 miles N. of Philadelphia. It was founded in 1741 by Moravians, under Count Zinzendorf, and is the chief center of that sect in the United States. It

contains a Moravian Theological Seminary, a Moravian Seminary for young ladies, more than a dozen churches, and two National banks. On the opposite side of the river, here spanned by two bridges, is SOUTH BETHLEHEM, the seat of LEHIGH UNIVERSITY (q. v.), the main offices of the Lehigh Valley Railroad Company, and a number of important manufacturing establishments, including silk mills, rolling mills, foundries and machine shops, brass works, zinc oxide and spelter works, etc. Monocacy creek separates Bethlehem from West Bethlehem, which is also an industrial borough. South Bethlehem, West Bethlehem and Northampton Heights now form a part of Bethlehem. Pop. (1910) 12,837; (1920) 50,358.

BETHLEHEM ("house of bread"; modern Beitlahm), the birthplace of Jesus Christ and of King David, and the Ephratah of the history of Jacob, is now a small, unwalled village of white stone houses. The population, about 8,000, is wholly Christian—Latin, Greek, and Armenian. The Convent of the Nativity, a large, square building, was built by the Empress Helena, in 327 A. D., but destroyed by the Moslems in 1236, and, it is supposed, restored by the crusaders. Within it is the Church of the Nativity, which is subdivided among the Latins, Greeks, and Armenians, for devotional purposes. The church is built in the form of a cross; the nave, belongs to the Armenians, and is supported by 48 beautiful Corinthian columns of solid granite. The other portions of the church, forming the arms of the cross, are walled up. At the farther end of that section, which forms the head of the cross, and on the threshold, is a sculptured marble star, which the Bethlehemites say covers the central point of the earth. Here a long intricate passage descends to the crypt below, where the blessed Virgin is said to have been delivered. The walls of the chamber are hung with draperies of the gayest colors; and a silver star, with the words, "*Hic de Virgine Maria Jesus Christus natus est*" (here Jesus Christ was born of the Virgin Mary), marks the spot of the Nativity. The manger stands in a low recess cut in the rock. The site appears to have been venerated since the 2d century, A. D. To the N. W. stands a square domed building, marking the reputed site of Rachel's tomb. The Bethlehemites chiefly gain their subsistence by the manufacture and sale of crucifixes, beads, boxes, shells, etc.

BETHLEHEMITES, a name applied (1) to the followers of Jerome Huss,

from Bethlehem Church, where he preached; (2) to an order of monks, established, according to Matthew Paris, in 1257, with a monastery at Cambridge; (3) to an order founded in Guatemala about 1655 by Fray Pedro, a Franciscan tertiary, a native of Teneriffe. It spread to Mexico, Peru, and the Canary Islands. An order of nuns founded in 1667 bore the same name.

BETHMANN - HOLLWEG, THEOBALD THEODORE FRIEDRICH ALFRED VON, German statesman; born in Hohenfinow, Brandenburg, Nov. 29, 1856. He received his education at the Univer-



THEOBALD VON BETHMANN-HOLLWEG

sities of Strassburg, Leipsic, Berlin, and Bonn. At the last named, he formed an intimate friendship with Wilhelm, the future German Emperor, who was a fellow-student. After holding a number of minor offices, he became Prussian Minister of the Interior in 1905, and his administration was signalized by a number of social reforms. He became Chancellor of the German Empire in 1909, and held the office for eight years, three of which were among the most important years of the world's history. How far he was concerned in the instigation of the World War has not been definitely determined, but his general character as a scholar, a philosopher, and a lover of peace would

appear to negative the thought that he wantonly precipitated the struggle. It seems more probable that he was not able to stand out against the powerful military clique who at the time guided the destinies of the Empire. Once the war was on, however, he bent all his energies toward its successful prosecution. Two episodes stand out strongly in his career. One was the celebrated interview with the English Ambassador, Sir W. E. Goschen, in which he deprecated the thought of England going to war for a mere "scrap of paper"—a fateful phrase that many times returned to plague its inventor and the nation of which he was the official mouthpiece. It was inconceivable, the Chancellor declared, "that just for a word—neutralit—a word which in war time had so often been disregarded—just for a scrap of paper, Great Britain was going to make war on a kindred nation." Another startling piece of frankness was his statement before the Reichstag Aug. 4, 1914: "We are now in a state of necessity, and necessity knows no law. Our troops have occupied Luxemburg and perhaps have already entered Belgian territory. Gentlemen, this is a breach of international law. The wrong—I speak openly—the wrong we thereby commit, we will try to make good as soon as our military aims have been attained." For a long time he stood against the policy of submarine ruthless warfare, but after it had been determined on, he backed it with all the power of his office. This, however, did not preserve him from the hostility of the militarists, who thought his conduct of the war was too "spineless" and he was compelled to resign July 14, 1917. He died in 1921. See GERMANY and WORLD WAR.

BETHSAIDA (beth-si'da), a village on the W. shore of the Lake of Galilee, the birthplace of Peter and Andrew and Philip. Its site has been identified with a heap of grass-grown ruins. At the N. E. extremity of the lake was another Bethsaida, a village, near which the 5,000 were fed. Philip the Tetrarch raised it to the dignity of a town, and renamed it Julias, in honor of the Emperor Augustus' daughter.

BETONY, a genus of plants belonging to the order *laminaceæ* (*labiates*). *Betonica officinalis*, or wood betony, grows in shady places. It is called by Bentham and others *stachys betonica*. When fresh it has an intoxicating effect; the dried leaves excite sneezing. The roots are bitter and very nauseous, and the plant is used to dye wool a fine, dark yellow.

BETTERTON, THOMAS, English actor, born in 1635; excelled in Shakespeare's characters of *Hamlet*, *Othello*, *Brutus*, and *Hotspur*, and was the means of introducing shifting scenes instead of tapestry upon the English stage. He wrote the "Woman Made a Justice," a comedy; "The Amorous Widow, or the Wanton Wife"; "Diocletian," a dramatic opera; etc. Mrs. Sanderson, whom he married in 1670, was also an actress of repute. He died in 1710, and was buried in Westminster Abbey.

BETTING, or WAGERING, a contract by which two or more parties agree that a certain sum of money or other thing shall be paid or delivered to one of them on the happening or not happening of an uncertain event. At common law, wagers are not *per se*, void, but statutes prohibiting betting have been passed by many of the States. When one loses a wager and gets another to pay the money for him, an action lies for the recovery of the money. Wagers on the event of an election laid before the poll is open, or after it is closed, are illegal. In horse-racing, simple bets upon a race are unlawful both in England and the United States. In the case even of a legal wager, the authority of a stakeholder, like that of an arbitrator, may be rescinded by either party before the event happens.

BETTY, WILLIAM HENRY WEST, better known as the YOUNG ROSCIUS, an English actor, born at Shrewsbury in 1791; first appeared on the stage at the age of 11 in *Belfast*, and achieved an immediate success. For almost five years he sustained the heaviest parts before crowded and enthusiastic audiences. In 1805 Mr. Pitt adjourned the House of Commons to permit members to witness the boy's *Hamlet*. He quitted the stage as a boy actor in 1808, but after studying for a while at Cambridge, returned to it in 1812. He retired finally in 1824. He died in London, Aug. 24, 1874.

BETULA, a genus of plants, the typical one of the order *betulaceæ* (birch-worts). The *B. alba*, or common birch, the *B. nana*, or dwarf birch, and the *B. papyracea*, or paper or canoe birch, are species included in this genus.

BETWA, a river of India rising in the Vindhya range in Bhopal, and, after a N. E. course of 360 miles, joining the Jumna at Hamirpur.

BEVELAND, NORTH and SOUTH, two islands in the province of Zeeland, Netherlands, in the estuary of the Scheldt. North Beveland is 13 miles

in length, contains about 15,000 acres; in 1532 it was submerged and remained under water for several years. South Beveland is about 20 miles in length, contains 84,000 acres; the soil is fertile, producing wheat, potatoes, and fruits.

BEVERIDGE, ALBERT JEREMIAH, an American lawyer, born in Highland co., O., Oct. 6, 1862; was brought up on a farm; graduated at DePauw University; and engaged in law practice in Indianapolis. He entered political life in 1883, and soon won a reputation as an effective orator. On Jan 17, 1899, he was elected United States Senator for Indiana, as a Republican. Soon after his election he went to the Philippines, made a thorough study of conditions, and, on the assembly of Congress in December following, delivered a thrilling speech in the Senate in support of the Administration's policy, regarding the islands. In 1906 he introduced an agricultural bill calling for a closer inspection of the packing industry. He was a leader of the Progressive party in 1912. Publications: "The Russian Advance" (1903); "The Young Man and the World" (1905); "America of To-day and To-morrow" (1908); "Pass Prosperity Around" (1912); "What is Back of the War" (1915); "John Marshall, a biography" (1916).

BEVERLY, a city in Essex co., Mass.; on the Boston and Maine railroad; 2 miles N. of Salem. It was founded Oct. 14, 1668; was incorporated as a city, March 23, 1894; contains several villages; and is connected by trolley lines with Salem, Peabody, Gloucester, and Wenham. It is the seat of the New England Institute for the Deaf and Dumb; is principally engaged in the manufacture of ladies' boots and shoes, and leather; has considerable shipping and fishery interests; contains high and graded schools, a public library, a National bank, a number of handsome residences belonging to Boston business men. Pop. (1910) 18,650; (1920) 22,561.

BEVIS OF HAMPTON, the hero of a popular English medieval romance. The son of Sir Guy, Earl of Hamtoun, who was treacherously murdered by Divoun, Emperor of Almayne, he was given by his false mother to some heathen merchants to be sold for a slave among the Paynim. By them he was carried to Ermyn, where he soon became dear to King Ermyn, and dearer still to his only daughter Josian. His chief exploits were the overthrow of Brademond of Damascus, of a monstrous boar, of the giant Ascapard, whom he spared to become

his squire, and of a dreadful dragon near Cologne. His famous sword Morglay he won in battle; his horse Arundel was the gift of Josian. Still more romantic episodes in his story are his carrying his own death-warrant in a sealed letter to the vassal Brademond, his escape from his noisome dungeon after seven years' imprisonment and recovery of his wife, who had preserved his love, though nominally the wife of King Ynor of Mombraunt. He next returned to England to avenge his father's death, then sailed for Ermony and defeated Ynor in a desperate battle. His last great fight was in the streets of London, when he slaughtered 60,000 citizens, and forced King Edgar to grant him terms. The romance was edited by Dr. E. Kölbing for the Early English Text Society, in 1885.

BEWICK, THOMAS, an English wood engraver, born in Northumberland in 1753. He was apprenticed to Beilby, an engraver in Newcastle, and executed the woodcuts for Hutton's "Mensuration" so admirably that his master advised him to turn his attention to wood engraving. With this view he proceeded to London, and, in 1775, received the Society of Arts prize for the best wood engraving. Returning to Newcastle, he entered into partnership with Beilby, and became known as a skilled wood engraver and designer by his illustrations to "Gay's Fables," "Æsop's Fables," etc. He quite established his fame by the issue, in 1790, of his "History of Quadrupeds." In 1797 appeared the first, and in 1804 the second, volume of his "British Birds," generally regarded as the finest of his works. Among his other works may be cited the engravings for Goldsmith's "Traveller," and "Deserted Village," Parnell's "Hermit," and Somerville's "Chase." He died in 1828.

BEYERS, CHRISTIAN FREDERICK, a South African general, born 1869; died Dec. 8, 1914. He chose the law as a profession, but served with distinction during the Boer War (1899-1902) and rose in rank until he became assistant commandant-general. A notable exploit was his capture of the British camp at Nootgedacht. After the close of the active fighting, he was chairman of the congress that met at Vereeniging to draft the treaty of peace. He later became speaker of the Transvaal Assembly. When the World War broke out, he thought he saw an opportunity to throw off British rule, to which he had never been in heart reconciled, and re-establish Boer control. He became a

leading figure in a conspiracy that included DeWet, Delarey, and other former Boer leaders, and that received a stimulus from a self-styled prophet whose "revelations" foretold the overthrow of the British. Beyers, at the head of volunteers, advanced against Pretoria, but was utterly defeated by General Botha and forced to flee with only a remnant of his followers into the Orange Free State. Here he suffered other reverses, and while in rout and attempting to cross the Vaal river, Dec. 8, 1914, fell from his horse and was drowned. His associates in the rebellion were also defeated and the movement suppressed.

BEYLE, MARIE HENRI (bâl), better known under the pseudonym of "Stendhal," a French novelist and critic, born in Grenoble, Jan. 23, 1783. Among his works are: "Rome, Naples and Forence in 1817," "History of Painting in Italy," and "About Love"; but his celebrity now rests principally upon "The Chartreuse of Parma," original, witty and absorbing; and to a less extent upon "The Red and the Black." He died in Paris, March 23, 1842.

BEYRUT, or BEIRUT, a vilayet of Syria, formerly a possession of Turkey: By the terms of the Treaty of Peace between that country and the Allied Powers, Beirut became a part of the independent state of Syria, over which France was given mandatory power. See SYRIA. The vilayet extends along the eastern shore of the Mediterranean from Latakia to Tripoli, and from below Sidon nearly to Jaffa. Area of vilayet 6,180 square miles. Pop. about 533,500.

BEYRUT, or BEIRUT, a city of Syria, and the chief port of Syria, the port for Damascus, southeast of Cyprus, on the south shore of St. George's Bay, with a lighthouse on the point beyond, picturesquely located at almost the very base of the Lebanon range of mountains. The city climbs a slope, has narrow, winding streets, is surrounded by many gardens, and is correctly assumed to have the healthiest climate on the coast. The summers are hot, but the winters are mild and palms grow in the vicinity. The city and the neighboring country were the scene of fighting between French and Turkish forces in 1920. See TURKEY and SYRIA. The French language is more used than any other except Arabic. Pop. about 150,000.

BEZA, or BEZE, THÉODORE DE, a French Protestant theologian and reformer, born in Vezelai, in 1519. After studying at Orleans and Bourges, he

went, in 1539, to Paris, where he spent nine years. He was appointed Professor of Greek at Lausanne, a post which he held for 10 years. In 1558, he was sent to ask the intercession of several German princes in behalf of the persecuted Huguenots in France. The next year



THÉODORE DE BEZA

he settled at Geneva, and was thenceforth the associate of Calvin till his death, and his successor as Professor of Theology and head of the Protestant party. Beza undertook a mission to the King of Navarre, and succeeded in winning him to the side of the reformers. He took a leading part at the celebrated Colloquy of Poissy, and was allowed to preach in Paris. He attended the Prince of Condé during the Civil War, and was at the battle of Dreux. His energy and activity of mind, like his bodily health, continued unabated. He only ceased preaching in 1600. Among his works are a Latin translation of the New Testament and "History of the Reformed Churches in France." He died in 1605.

BÉZIERS (bez-yär'), a town in southern France, department of Hérault, beautifully situated on a height and surrounded by old walls, its chief edifice being the cathedral, a Gothic structure, crowning the height on which the town stands; manufactures: woolens, hosiery, liquors, chemicals, etc., with a good trade in spirits, wool, grain, oil, verdigris, and fruits. In 1209 Béziers was the scene

of a horrible massacre of the Albigenses. It suffered also in the religious wars of the 16th century. Pop. about 52,000.

BEZIQUE (bez-èk'), or **BESTIQUE**, a popular game of cards of French origin in which a double pack containing the aces, tens, kings, queens, knaves, nines, eights, and sevens are used, valued in the order given. The game is played by two persons, to whom eight cards are dealt. Trumps may be determined either by turning up the first card of the stack or by the suit of the first marriage. The non-dealer leads for the first trick, and the winner of each trick has the succeeding lead. After each trick, each player draws one card from the top of the stack, the winner of the trick taking the top card. The playing is as in whist, the leader taking the trick unless his opponent plays a higher card of the same suit or a trump. It is not necessary to follow suit until the stack is exhausted, when one must do so and take each trick, if possible. Counting is done by means of the values of the cards; each ace or ten-spot taken in a trick counts 10, the winner of the last trick of each hand scores 10, and if trump is turned, both sevens count 10 for the turner, and if one exchanges from his hand a seven of trumps for another turned trump or if one declares the other seven of trumps 10 more is scored. The game is won by the player who first makes 1,000 points, and if his opponent has not made 500 the game counts double. There are certain combinations of cards other than the above, which, when declared, count as follows: Double bezique (both queens of spades and both knaves of diamonds), 500; sequence of five highest trumps, 250; and 4 aces, 100; any 4 kings, 80; any 4 queens, 60; any 4 knaves, 40; bezique (queen of spades and knave of diamonds), 40; royal marriage (king and queen of trumps), 40; marriage (king and queen of same suit), 20. A declaration is made by placing the declared cards face up on the table where they remain till played or the stack is exhausted, except in the case of the seven of trumps. To score, a declaration can only be made after winning a trick and before drawing, and but one declaration can be made at a time. After a card has been used in one combination it may be used to form another, excepting when used to form an equal or inferior combination in the same class as before. A player need not declare a combination which he holds and only before the stack has been exhausted can a declaration be made.

BHAGALPUR (be-häg-äl-pör'), a city in Bengal, capital of a district and division of the same name, on the right bank of the Ganges, here 7 miles wide. There are several indigo works in the neighborhood. Pop. about 75,000. The division of Bhagalpur has an area of 20,511 square miles, and a population of about 8,200,000. The district has an area of 4,226 square miles; pop. about 2,150,000.

BHAGAVATGITA (be-häg-è-vet-gé-te), or **BHAGAVADGITA**, in Sanskrit literature, a song relating a discourse between Krishna and his pupil Arjun in the midst of a battle. Its teaching is pantheistic. It consists of 18 lectures. It has been translated into many languages.

BHAMO, a town of Burma on the upper Irrawaddy, about 40 miles from the Chinese frontier. It is the starting-point of caravans to Yunnan, and is in position to become one of the great emporiums of the East in event of a regular overland trade being established between India and west China.

BHARTPUR, or **BHURTPORE**, the capital of a protected state in Rajputana, India, is a large town, measuring about 8 miles in circuit, 35 miles W. of Agra by rail. It is worthy of notice chiefly on account of its two sieges in 1805 and 1827. Pop. about 35,000. The state of Bhartpur has an area of 1,982 square miles; pop. about 580,000, mostly Jâts.

BHAWALPUR (be-hä-wäl-pör'), a state of the Punjab, British India, S. of the Indus and Sutlej rivers. It is chiefly a desert of shifting sand. Only the river banks are cultivable. The inhabitants are Jâts, Baluchis and Afghans, the greater part Mohammedans. Area, 15,000 square miles. Pop. about 785,000. Bhawalpur, the capital, is on a branch of the Sutlej. It is noted for the manufacture of a kind of turban and scarf very popular among the Hindus; also produces considerable woolen, silk, and cotton cloth, indigo, alum, and saltpeter.

BHEELS, or **BHILS**, a Dravidic race inhabiting the Vindhya, Satpura, and Satmala Hills, a relic of the Indian aborigines driven from the plains by the Aryan Rajputs. Various attempts to subdue them were made by the Gaekwar and by the British in 1818 without success. A body of them was, however, subsequently reclaimed, and a Bheel corps formed, which stormed the retreats of the rest of the race and re-

duced them to comparative order. The hill Bheels wear little clothing, and live precariously on grain, wild roots and fruits, vermin, etc., but the lowland Bheels are in many respects Hinduzed. Their total numbers are about 1,250,000.

BHOPAL, a native state of central India, under British protection, on the Nerbudda, in Malwah. Area, 12,842 square miles. The country is full of jungles, and is traversed by a part of the Vindhya Mountains. The soil is fertile, yielding wheat, maize, millet and peas. Chief exports: sugar, tobacco, ginger, and cotton. Pop. about 1,375,000. The capital of above state, also called Bhopal, is on the boundary between Malwah and Gundwana. Pop. about 60,000.

BHUTAN, an independent state in the eastern Himalayas, with an area of about 34,000 square miles, lying between Tibet on the N. and Assam and the Jalpaiguri district on the S. Pop. about 250,000. The Bhutanese are a backward race, governed by a Dharm Rajah, regarded as an incarnation of deity, and by a Deb Rajah, with a council of eight. They are nominally Buddhists. After various aggressive incursions and the capture and ill treatment of Ashley Eden, the British envoy, in 1863, they were compelled to cede to the British considerable portions of territory, in return for a yearly allowance of £2,500. By an amended treaty of 1906 Great Britain agreed not to interfere in the government. In 1907, Sir Ugyen Wangchuk was the first elected Maharajah of Bhutan. This allowance was increased in 1910 to £6,667.

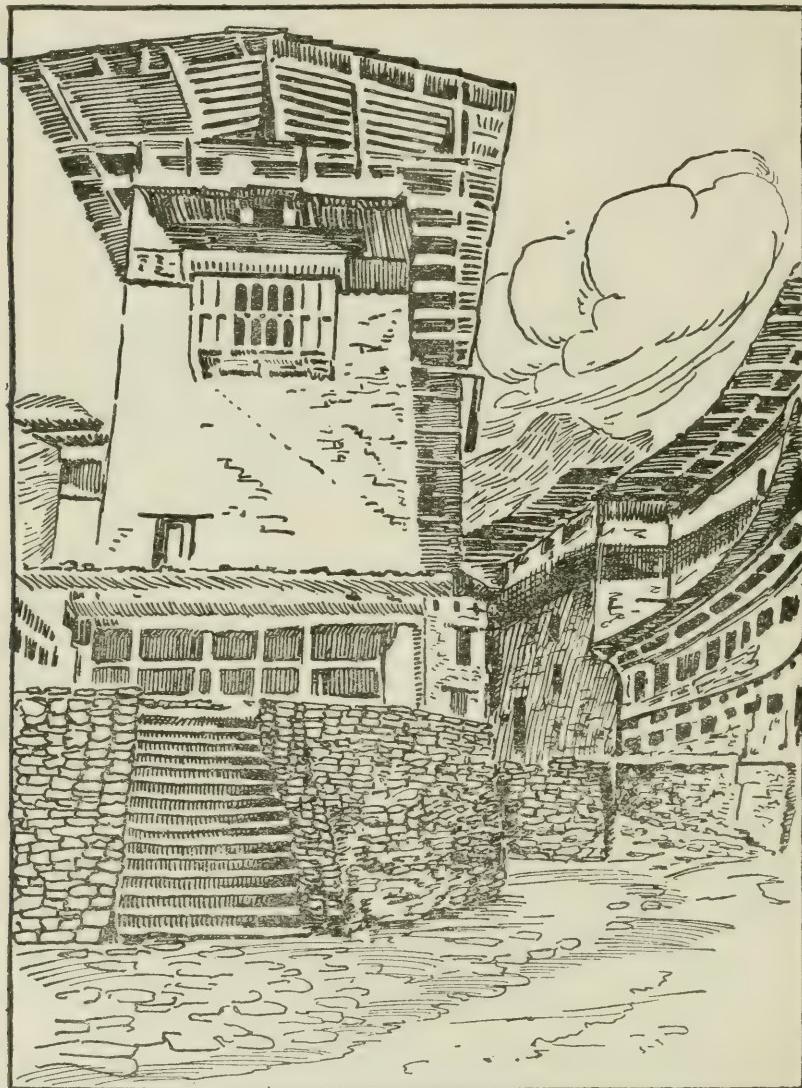
BIAFRA, BIGHT OF, a large bay on the W. coast of Africa, at the head of the Gulf of Guinea, between Capes Formosa and Lopez. The principal rivers flowing into it are the Niger, the New and Old Calabar rivers, the Rio del Rey, the Kamerun, and the Gaboon; its islands are Fernando Po (Spanish), and St. Thomas' and Prince's Islands (Portuguese). Opposite Fernando Po are the Kameruns.

BIARRITZ, a watering-place and noted winter resort in France; on the Bay of Biscay in the department of the Basses-Pyrénées; 4 miles S. W. of Bayonne. Pop. about 20,000.

BIAS, one of the seven sages of Greece; a native of Priene, in Ionia; celebrated for his practical knowledge and strict regard to justice. He flourished about 500 B. C.

BIB, also called BRASSY, POUT, or WHITING POUT (*gadus luscus*), a fish of the same genus as the cod, haddock, and whiting, quite common on many parts of the British coasts, found also on those of Norway, Sweden,

BIBERACH (bē'b'rach), a town of Württemberg, delightfully situated on the Riss, 23 miles S. S. W. of Ulm. It contains a monument to Wieland, who was born in the neighborhood. There are manufactures of machinery, artifi-



FORT AT ENTRANCE TO BHUTAN

Greenland, etc. It is seldom more than a foot long, but differs from the other British *gadidae* in the great depth of its body, which equals at least one-fourth of the entire length. The head is invested with a loose, dilatable membrane.

cial flowers, leather, bells, children's toys, etc. Pop. about 9,000. Here, in 1796, Moreau won a great victory over the Austrian General Latour, and in 1800, Saint Cyr defeated the Austrian General Kray. Biberach fell into the possession of Baden in 1802, but four

years afterward was ceded to Württemberg.

BIBLE, the book, in comparison with which other literary productions are not worthy to be dignified with the name of books; or, if they be called books, it then becomes the Book of books. The idea just expressed is founded on the etymology derived originally from the Christian Greeks, but now rooted in the languages of all the nations of Christendom. The first to use the term *biblia* in this sense is said to have been Chrysostom, who flourished in the 5th century. The word scripture or scriptures, from the Latin *scriptura* = writing, *scripturæ* = writings, conveys the analogous idea that the Scriptures are alone worthy of being called writings. This use of the word came originally from the Latin fathers, but it has been adopted not merely by the English, but by the other Christian nations of Europe.

The Church of Rome does not differ from the several Protestant denominations respecting the Divine authority of the books which the latter accept as canonical; it combines, however, with them the Apocrypha and Church traditions, regarding faith and morals, which Protestants reject.

Articles of faith and symbolical books do not always express the real belief of all who nominally assent to them; and scattered through the several churches are a very large number of persons who hold that the Bible contains a revelation from God, instead of being of itself the Word of God; while a small number deny the Scriptures all special inspiration, and deal with them as freely as they would with the Mohammedan Koran, the Hindu Vedas, etc.

The Bible consists of 66 books, constituting an organic whole.

In the Authorized English Version the Bible is divided into the Old and New Testaments, the former containing 39, and the latter 27 books.

The Old Testament was originally written in Hebrew, except Jer. x: 11; Ezra iv: 8 to vi: 18; vii: 12 to 26; and Dan. ii: from middle of verse 4 to vii: 28, which are East Aramaean (Chaldee). The New Testament was originally written in Greek, with the exception, perhaps, of St. Matthew's Gospel, which the Christian fathers, Papias, Irenæus, Pantænus, Origen, Jerome, etc., state to have been published originally in Aramaean.

The order of the books in the Hebrew Bible is different from that which obtains in the English Scriptures, which,

in this respect, follow the Greek Septuagint and the Latin Vulgate. The Jews divided the Old Testament primarily into three portions, called the Law, the Prophets, and the Kethubim, or, in Greek, the Hagiographa. The following list exhibits the order and classification of the books in the Hebrew Bible:

I. *Torah, the Law*: Genesis, Exodus, Leviticus, Numbers, and Deuteronomy.

II. *Nebiim, the Prophets*: (1) *The former prophets*: Joshua, Judges, Samuel, Kings. (2) *The later prophets*: (a) *The great prophets*: Isaiah, Jeremiah, Ezekiel. (b) *The small or minor prophets*: Hosea, Joel, Amos, Obadiah, Jonah, Micah, Nahum, Habakkuk, Zephaniah, Haggai, Zechariah, Malachi.

III. *Kethubim* = books; in Greek *Hagiographa* = holy writings: (1) *Truth*: Psalms, Proverbs. (2) *The five rolls*: Job, Song of Solomon, Ruth, Lamentations, Ecclesiastes, Esther, Daniel, Ezra, Nehemiah, Chronicles.

A convenient classification for modern use divides the Old Testament books into three classes: (1) *The Historical Books*: Genesis—Ezra. (1) *The Poetical Books*: Job—Song of Solomon. (3) *The Prophetical Books*: Isaiah—Malachi.

A similar division for the New Testament is into: (1) *Historical Books*: Matthew—The Acts of the Apostles. (2) *Epistles*: Romans—Jude. (3) *The Prophetical Book*: Revelation.

The Old Testament is said to have been collected and arranged by Ezra between 458 and 450 B. C. The Apocrypha are considered inspired writings by the Roman Catholics, but not by the Jews and Protestants.

OLD TESTAMENT

B. C.

Genesis	contains the history of the world	from 4004—1635
Exodus	. . . . .	1635—1490
Leviticus	. . . . .	1490
Numbers	. . . . .	1490—1451
Deuteronomy	. . . . .	1451
Job	. . . . .	about 1520
Joshua	. . . . .	from 1451—1420
Judges	. . . . .	1425—1120
Ruth	. . . . .	1822—1312
I and II Samuel	. . . . .	1171—1017
I and II Kings	. . . . .	1015—562
I and II Chronicles	. . . . .	1004—536
Book of Psalms (chiefly by David)	. . . . .	1063—1015
Proverbs, written . . . . .	. . . . .	about 1000—700
Song of Solomon . . . . .	. . . . .	about 1014
Ecclesiastes . . . . .	. . . . .	about 977
Jonah . . . . .	. . . . .	about 862
Joel . . . . .	. . . . .	about 800
Hosea . . . . .	. . . . .	about 785—725
Amos . . . . .	. . . . .	about 787
Isaiah . . . . .	. . . . .	about 760—698
Micah . . . . .	. . . . .	about 750—710
Nahum . . . . .	. . . . .	about 713
Zephaniah . . . . .	. . . . .	about 630
Jeremiah . . . . .	. . . . .	about 629—538
Lamentations . . . . .	. . . . .	about 538
Habakkuk . . . . .	. . . . .	about 626
Daniel . . . . .	. . . . .	from 607—534
Ezekiel . . . . .	. . . . .	from 595—574

	B. C.
Obadiah	about 587
Ezra	about 536—456
Esther	about 521—495
Haggai	about 520
Zechariah	about 520—518
Nehemiah	about 446—434
Malachi	about 397

NEW TESTAMENT

A. D.

GOSPELS by Matthew, Mark, Luke, and John	5 B. C.—33
Acts of the Apostles	33—65
EPISTLES—I and II of Paul to Thessalonians	54
To Galatians	58
1st Corinthians	59
2d Corinthians	60
Romans	60
Of James	60
1st of Peter	60
To Ephesians, Philippians, Colossians, Hebrews, Philemon	64
Titus, and 1st to Timothy	65
2d to Timothy	66
2d of Peter	66
Of Jude	66
1st, 2d, and 3d of John	90
Revelation	96

The most ancient copy of the Hebrew Scriptures existed at Toledo, called the Codex of Hillel; it was of very early date, probably of the 4th century after Christ; some say about 60 years before Christ. The copy of Ben Asher, of Jerusalem, was made about 1100.

The reputed oldest copy of the Old and New Testament in Greek, is that in the Vatican, in Rome, which was written in the 4th or 5th century.

BIBLE CHRISTIANS, a Christian sect, called also Bryanites. It was founded by William O'Bryan, a Wesleyan local preacher in Cornwall, England, in 1815. In 1829 he left the body he had formed.

BIBLE OATH, an oath sworn upon the Bible.

BIBLE SOCIETY, any society constituted for multiplying copies of the Bible, and, as far as the financial resources at its disposal will permit, diffusing them abroad. Of these societies the following may be enumerated:

1. **American Bible Society**: The American Bible Society was founded in 1816. Sixty delegates, from 12 States of the Union, met in New York City and organized the society. All its publication are issued at cost; below cost, and free. Bibles in 84 languages have been scattered over the United States. In 1918 the Society issued 6,040,000 bibles.

2. In the United Kingdom these societies for circulating the scriptures were established: The Society for the Propagation of the Gospel in New England, incorporated in 1649, and again in 1661; the Society for Promoting Christian Knowledge, established in 1698; the So-

cieties for the Propagation of the Gospel, established in 1701; the Society in Scotland for Propagating Christian Knowledge, incorporated in 1709; the Society at Halle, founded in 1712; the Society for Promoting Religious Knowledge Among the Poor, established in 1750; and, finally, the Society for the Support and Encouragement of Sunday-Schools, established in 1785. Two societies made it their primary aim, viz.: The Bible Society for Soldiers and Sailors, established in 1780, and the French Bible Society, commenced in London in 1792, its object being the circulating of the Scriptures in France. With all that was done by these organizations, however, Bibles were both costly and difficult to obtain.

It was to cheapen the cost and increase the production that a great bible society came into existence in 1803, under the name of "The Society for Promoting a More Extensive Circulation of the Scriptures Both at Home and Abroad." In March, 1804, it was more formally constituted at a meeting held in the London Tavern, Bishopsgate, its too lengthened designation being condensed to the British and Foreign Bible Society. Its rise to power was rapid. On March 28, 1809, an auxiliary Bible society was established at Reading, and many similar auxiliaries or branches soon followed in other places.

3. The German Bible Society, formed at Nuremberg in 1804, and afterward transferred to Basel.

4. The Prussian Bible Society, so named in 1814, developed out of the Berlin Society, formed in 1804 or 1805.

5. The Hibernian Bible Society, formed in 1806.

6. The Philadelphia Bible Society, the first in the United States, founded in 1808.

7. The City of London Bible Society, founded in 1812.

8. The Russian Bible Society, established under the auspices of the Emperor Alexander in 1813, but suppressed in 1826 by his successor, Nicholas, the antagonist of the allies in the noted Crimean War.

9. The American Bible Society, founded in 1816. It has now many auxiliaries in connection with it.

10. The Trinitarian Bible Society, founded in 1831.

11. The National Bible Society of Scotland, founded in 1860, with which the Edinburgh Bible Society (1809) and the Glasgow organization (1812) are now incorporated.

Bible societies, though wide in their constitution, are practically Protestant

institutions; and, on June 29, 1816, a bull denouncing them was launched by Pope Pius VII.

BIBLES, THE SEVEN, the seven principal Bibles of the world are the Koran of the Mohammedans, the Eddas of the Scandinavians, the Tripitakes of the Buddhists, the Five Kings of the Chinese, the three Vedas of the Hindus, the Zend Avesta and the Scriptures of the Christians. The Koran is, except the Eddas, the most recent of these seven Bibles and not older than the 7th century of our era. It is a compound of quotations from the Old and New Testaments, the Talmud and the Gospel of St. Barnabas. The Eddas of the Scandinavians was first published in the 14th century. The Tripitakes of the Buddhists contain sublime morals and pure aspirations, but their author lived and died in the 6th century before Christ.

The sacred writings of the Chinese are called the Five Kings, king meaning web of cloth or the warp that keeps the threads in their place. They contain the best sayings of the best sages on the ethico-political duties of life. These sayings cannot be traced to a period higher than the 11th century before Christ. The three Vedas are the most ancient books of the Hindus, and it is the opinion of Max Müller, Wilson, Johnson and Whitney that they are not older than 11 centuries before Christ. The Zend Avesta of the Persians is the grandest of all these sacred books next to our Bible. Zoroaster, whose sayings it contains, was born in the 12th century before Christ.

BIBLIA PAUPERUM (Bible of the poor), the name for block books common in the Middle Ages, and consisting of a number of rude pictures of Biblical subjects with short explanatory text accompanying each picture.

BIBLICAL CRITICISM, the science which has for its objects (1) to decide which books are entitled to have a place in the Scripture canon, and (2) to bring the text of these canonical books to the utmost possible degree of purity. In prosecuting the first of these aims, the Biblical critic must not be confounded with the Christian apologist; the function of the former is a strictly judicial one, while the office of the latter is that of an advocate. One important subject of investigation is as to what Old Testament books were recognized as divine by the ancient Jewish Church or Synagogue; as also what New Testament books were at once and universally welcomed by the early Christian Church,

and what others were for a time partially rejected, though they ultimately found acceptance everywhere. Biblical Criticism has received its highest development in the hands of German scholars, who attacked its problems with an energy and destructiveness which, for a time, threatened to leave little of the authority or authenticity of the text. In recent years a reaction from these radical methods has set in, and while scholars recognize the necessity of applying the laws of criticism to the sacred texts, there is a pronounced disposition, founded on archæological and philological researches, to leave the authority of the texts unimpaired, unless there is unquestioned reason for disputing it.

BIBLIOGRAPHY, the science or knowledge of books, their authorship, the dates of their first publication, and of the several editions they have gone through, with all other points requisite for literary history. This, it will be perceived, is not the meaning of the word in Greek. The Greek term generated the French *bibliographie*, with the meaning (identical with neither the Greek nor the English one) of acquaintance with ancient writings and skill in deciphering them. About A. D. 1752 the modern sense of the word was arising, though the old one still held its ground. Finally, in 1763, the publication of De Bure's "Bibliographie Instructif" established the new meaning, and gave the deathblow to the old one. It was not the first book which had appeared on literary history, Conrad Gesner's "Bibliotheca Universalis," containing a catalogue of all the Hebrew, Greek, and Latin books he knew, had long preceded it, having appeared in 1545.

BIBLIOMANIA, the passion of the book miser, which impels to the gathering and hoarding of books without regard to their literary value or practical utility; or, in its nobler aspects, in Andrew Lang's phrase, the "love of books for their own sake, for their paper, print, binding, and for their associations, as distinct from the love of literature." The word in English is modern, having been introduced from France about 1750.

BIBRACTE (bē-brak'tē), a town of ancient Gaul; was the capital of the *Ædui*, whom Cæsar once defeated; the modern Autun.

BICARBONATE, a name given to the acid carbonates of potassium (KHCO_3), sodium (NaHCO_3), ammonium (NH_4HCO_3), etc. Also a carbonate dissolved

in water containing carbonic acid gas, as carbonate of calcium thus dissolved, reprecipitated on boiling. Bicarbonate of potassium, KHCO_3 , is obtained by passing CO_2 gas through a saturated aqueous solution of K_2CO_3 (potassium carbonate). It crystallizes in colorless rhombic non-deliquescent crystals, which are soluble in four times their weight of water. It does not give a precipitate with BaCl_2 in the cold. Bicarbonate of potassium is a direct antacid, and is employed in the treatment of acute rheumatism and for removing uric acid from the system.

BICE, the name of two colors used in painting, one blue, the other green, and both native carbonates of copper, though inferior kinds are also prepared artificially.

BICEPS, in anatomy, muscles having two heads or origins. Three muscles of the human body have this name applied to them. One is the *biceps humeri*, or *biceps internus humeri*, and a second the *biceps extensor*, both of which are in the arm, and the *biceps femoris*, which is the straight muscle of the thigh. In botany applied to papilionaceous corollas, which have the claws of the two petals composing the keel distinct instead of united.

BICÉTRE (bē-sāt're), a village of France, 1 mile from Paris, where, in the reign of Charles V., a large building was erected for disabled soldiers, destroyed in the wars under Charles VI. It was rebuilt by Louis XIII., and was used as a military asylum until the Hôtel des Invalides was established at Paris. It was afterward used as a hospital.

BICHLORIDE OF GOLD, in chemistry and pharmacy, $\text{Au}^{\text{II}}\text{Cl}_2$, a substance which has risen into notoriety on account of the use made of it by the late Dr. Keeley of Dwight, Ill., in the cure of dipsomania and chronic alcoholism. Its general characteristics chemically, posologically, and in physiological action are to a great extent similar to those of mercury bichloride.

BICKERSTAFF, ISAAC, an Irish dramatic writer, born about 1735; wrote many successful pieces for the stage, some of which are still popular, and was a friend of Garrick, Boswell, etc. He died about 1812. In English literature the name Isaac Bickerstaff occurs as the name assumed by Swift in his controversy with Partridge, the almanac maker, and also as the pseudonym of Steele, as editor of the "Tatler."

BICKERSTETH, EDWARD, a clergyman of the Church of England, born in 1786; was in business as a solicitor in Norwich for a time, but took orders and went to Africa in 1816 to reorganize the stations of the Church Missionary Society. Returning to England he was chosen secretary to that society. In 1830 he became rector of Watton in Hertford, and was one of the founders of the Evangelical Alliance. His publications, which had an immense circulation, included the "Christian Student," "A Treatise on the Lord's Supper," "A Treatise on Prayer," and "The Signs of the Times." He died in 1850.

BICKERSTETH, EDWARD HENRY, an American bishop and poet, born in Islington, England, Jan. 25, 1825. He is author of "Rock of Ages" (1859); "Yesterday, To-day and Forever" (1866); "The Hymnal Companion to the Book of Prayer;" and some poems. He was consecrated Bishop of Exeter in 1885. He died in London, 1906.

BICKMORE, ALBERT SMITH, an American naturalist, born in St. George, Me., March 1, 1839; graduated at Dartmouth College in 1860, and studied under Agassiz at the Lawrence Scientific School of Harvard. In 1865-1868 he traveled in the Malay Archipelago and in eastern Asia; in 1869 became Professor of Natural History in Madison (now Colgate) University; and, in 1885, Professor in charge of the Department of Public Instruction at the American Museum of Natural History, New York City (1882-1904). His publications include "Travels in the East Indian Archipelago" (1869); "The Ainos or Hairy Men of Jesso." He died on Aug. 12, 1914.

BICKNELL, a city of Indiana, in Knox co. It is on the Indianapolis and Vincennes railroad and on the White river. It is the center of an extensive coal region and there are several important mines in the vicinity. Pop. (1910) 2,794; (1920) 7,635.

BICYCLE, a two-wheeled instrument driven by pedal cranks on either side and propelled by the rider, who sits astride upon a seat, or saddle, which is mounted on a frame in which the wheels are set. A handle bar in front is used to guide the forward wheel, which acts as a steering wheel, to preserve or change the direction. In the early, and now obsolete form, the bicycle was propelled by striking the rider's feet on the ground. The rider sat upon a figure or frame, roughly resembling the body of a horse. The bicycle is a gradual evolution from a four-wheeled, self-propel-

ling machine invented as long ago as 1649. In 1816, Karl von Drais, Freiherr von Sauerbroon (1784-1851), built a rudimentary bicycle, consisting of two wheels, one before the other, connected by a perch, the forward wheel axled in a fork swiveled to the forward end of the perch and bearing a cross-bar or handles for steering. The rider sat astride the perch and propelled the machine by thrusting his feet on the ground and on level ground could easily make 5 miles an hour. The Drasine, or Draisine, as this first machine was called, was patented in Paris in 1816. It was introduced into England in 1818, and patented there with some improvements by a man named Knight. It very soon acquired the name of "dandy horse" or "hobby horse." In 1819 the "hobby horse" was brought to the United States and created great enthusiasm in many of our leading cities. But the fever did not last long. It is asserted, though not proved, that a Scotchman, Kirkpatrick MacMillan, having tried a system of cranks, side-levers, connection rods, and pedals for propelling a tricycle, in 1815, applied them to a wooden bicycle in 1840, and used it with success. In 1846, Gavin Dalzel, or Dalzelle, who is said to have seen MacMillan's machine, invented and rode a rear driving velocipede propelled by pedals on hanging levers which, by means of connecting rods instead of chains, rotated cranks on the rear axle. In 1855, Michaux, a Parisian carriage-maker, built a velocipede which was propelled by cranks on the front wheel. Ten years later Pierre Lallement invented the front driving velocipede, which gained a wonderful though short-lived popularity. He patented it in the United States in 1866. Before the velocipede craze had passed the English manufacturers conceived the idea of enlarging the front wheel, and the high bicycle with suspension wheels was speedily developed. For some years the two wheels were of very unequal size, the rider being mounted directly over the very large one. It was so high that mounting was difficult and a fall dangerous. It was used only by men and high speed was attained. About 1884 the high wheel began to be abandoned for the modern type, usually called the "Safety," in which, at first, the large wheel was made smaller and the smaller one larger, and afterward both wheels were made of equal diameter, speed being gained by the rear wheel having a high gear. The old type had hard rubber tires for the wheels. The introduction of the pneumatic tire in 1891, by J. B.

Dunlop, wrought a practical revolution in the bicycle industry. From being merely an instrument for recreation and sport, it became one of the most common vehicles upon the highways. The "safety" bicycles were adopted for military purposes by many of the nations of the world. The invention of the motorcycle, however, caused this swift and more powerful vehicle to supersede the bicycle for military use.

The popularity of the bicycle in the United States began to decline early in the 20th century. Its use as a mode of conveyance is, however, still wide, especially in the rural districts, and in foreign countries its popularity as a pleasure vehicle still persists.

BIDAR, or **BIDDERY**, a town in British India, in a district of the same name; 72 miles N. W. of Haidarabad. It is noted for a metal ware manufactured there and known as Biddery ware. The ware is made from an alloy of copper, 8 parts; lead, 4; and tin, 1. To 3 ounces of this alloy 16 ounces of zinc are added, when the alloy is melted for use. It is colored by dipping into a solution of sal-ammoniac, saltpeter, common salt, and sulphate of copper. This colors it, and the color forms a ground for the silver and gold inlaying. Chisels and engravers are employed, and, after the inlaying is complete, the ware is polished and stained. Many articles of Indian manufacture, remarkable for elegance of form and gracefully engraved patterns, are made of it.

BIDASSOA, a river of northeastern Spain, forming, for some distance, the boundary between France and Spain. In 1813 Wellington effected the passage of the Bidassoa and entered France.

BIDDEFORD, a city in York co., Me.; on the Saco river, and the Boston and Maine railroad; 15 miles S. W. of Portland, and 6 miles from the Atlantic Ocean. It derives its name from Bideford, England; was settled under a patent in 1630, although a small settlement was made in the vicinity near the mouth of the river in 1616, and was given a city charter in 1855. The city has an excellent water-power promoted by a fall of 42 feet in the river here; manufactures of cotton goods, large lumber interests, and extensive ledges of granite which provide an important and growing industry. There are two National banks, more than a dozen churches, daily, weekly, and monthly periodicals, public library, trolley line to Old Orchard Beach. Pop. (1910) 17,079; (1920) 18,008.

BIDDLE, CLEMENT, the "Quaker Soldier," was born in Philadelphia, May 10, 1740. Although a strict Quaker, he identified himself with the Revolutionary cause even to the extent of going to war. He was present at the battles of Princeton, Brandywine, Germantown and Monmouth. He also shared the sufferings of Valley Forge. He resigned active service in 1780, but assisted in the making of the Federal Constitution in 1787. After that he was United States marshal of Pennsylvania. He died in Philadelphia, July 14, 1814.

BIDDLE, JAMES, an American naval officer, born in Philadelphia, Pa., in 1793; entered the navy as a midshipman on the "Philadelphia" in 1800, and was on that frigate when she was wrecked on the Barbary coast in 1803. In the War of 1812 he served on the "Wasp" in the capture of the British sloop "Frolic," and was captain of the "Hornet" at the capture of the "Penguin." In 1845 he was given command of the East India Squadron and concluded the first treaty between the United States and China. He died in Philadelphia, Oct. 1, 1848.

BIDDLE, JOHN, father of the modern Unitarians, born in Wotton-under-Edge, in Gloucestershire, in 1615; was educated at Oxford, and became master of a free school at Gloucester. He was repeatedly imprisoned for his anti-Trinitarian views. A general act of oblivion, in 1652, restored him to liberty, when he immediately disseminated his opinions both by preaching and by the publication of his "Twofold Scripture Catechism." He was again imprisoned, and the law of 1648, decreeing death for those denying the Trinity, was put in operation against him. Cromwell banished him to St. Mary's Castle, Scilly, and assigned him 100 crowns annually. Here he remained three years, until the Protector liberated him in 1658. He then continued to preach his opinions till the death of Cromwell, and also after the Restoration, when he was committed to jail in 1662, and died a few months after. He wrote "Twelve Arguments Against the Deity of the Holy Spirit," etc.

BIDDLE, NICHOLAS, an American naval officer, born in Philadelphia, Pa., Sept. 10, 1750. After serving in the British navy and in the Arctic exploring expedition led by Captain Phipps, he returned to his native country at the outbreak of the Revolution, and was one of the five officers who received the rank of captain at the or-

ganization of the American navy in 1775. In command of the "Andrea Doria" he accompanied Fleet-Captain Hopkins to the Bahamas, and was present at the capture of New Providence. In 1777 he took command of the 32-gun ship "Randolph," the first American frigate ever launched. He met the British "Yarmouth," 64 guns, on March 7, 1778, and in the ensuing action the "Randolph" blew up, causing the death of her captain and about 315 others.

BIDDLE, NICHOLAS, an American financier, born in Philadelphia, Pa., Jan. 8, 1786; became secretary to John Armstrong, United States Minister to France, in 1804, and subsequently went to England as secretary to James Monroe, then United States Minister. He returned home in 1807, was elected to the Pennsylvania Legislature in 1810, and was appointed a director of the United States Bank in 1819. He became president of the bank in 1823 and managed it ably down to the expiration of its charter. The financial trouble precipitated upon the country by Jackson's withdrawal of the Government deposits in 1833 gave an unfortunate ending to Biddle's career as a banker. His integrity has since been vindicated. He published a "Commercial Digest," and "History of the Expedition under Lewis and Clark to the Pacific Ocean." He died in Philadelphia, Feb. 27, 1844.

BIDENTAL REPTILES, in palaeontology, the name given by Andrew Geddes Bain, surveyor of military roads in South Africa, to certain notable reptiles found there about 500 miles E. of Cape Town. The name was given because of their possessing two long, curved and sharp-pointed tusks.

BIDPAI (bid'pi), or **PILPAI**, the reputed author of a very ancient and popular collection of Eastern fables. The original source of these stories is the old Indian collection of fables called "Panchatantra," which acquired its present form under Buddhist influences not earlier than the 2d century B. C. It was afterward spread over all India and handed down from age to age in various more or less different versions. An abridgment of this collection is known as the "Hitopadesa." The first English translation was published in 1570.

BIEDA (bé'da), the modern name of the ancient Blera, a town in Italy. It is noted for its extensive Etruscan necropolis of rock-hewn tombs, which are built in several terraces. These tombs are interesting from their imitation of dwellings.

BIELA (bē'lā), **WILHELM, BARON VON**, an Austrian army officer, born in Roslau, Prussia, March 19, 1782; known from his discovery of the comet bearing his name. He died in Venice, Feb. 18, 1856.

BIELA'S COMET, a comet which took its name from Major Biela of the Austrian army, who traced it out in 1826 and furnished such data regarding its movements as to convince the other astronomers of his day that he had a proprietary right to it. The same comet had been noticed on March 8, 1772, and again in 1805. It was reckoned that the comet had passed its perihelion six times between the two periods without being detected by the astronomers. On another visit it passed out of sight on Jan. 3, 1833. Its next appearance was in July, 1839. It was found again late in November, 1845, when it was discovered to have divided into two parts. Late in August, 1852, the larger part came into view and three weeks later the smaller, now much fainter than its former companion, was seen about a million miles in the lead. From this time it has not been seen. Astronomers looked for the reappearance of this stream of meteors Nov. 13-14, 1899, but were disappointed, only a few stray meteors putting in an appearance.

BIELOZERO (Polish, the white lake), a lake 25 miles long by 20 miles broad, in the province of Novgorod, Russia; named from its milky appearance, caused by the wash of the chalk formation of its bed. It has an outlet into the Volga by the river Sheksua.

BIELSHÖHLE (bēls'he-la), a stalactite cavern in the Harz Mountains, on the right bank of the Bode. It was discovered about 1672, but first made accessible in 1788. Its entrance is 108 feet above the bed of the stream; and its total length is 230 yards.

BIENNE (bē-en'), or **BIEL**, a town of Switzerland, canton of Bern, 16 miles N. W. of Bern, beautifully situated at the N. end of the lake of the same name, and at the foot of the Jura. Pop. about 25,000. The lake is about 10 miles long by 3 broad. It receives the waters of Lake Neufchâtel by the Thiel and discharges itself into the Aar.

BIENNIAL, a plant that requires two seasons to come to maturity, bearing fruit and dying the second year, as the turnip, carrot, wall flower.

BIENVILLE, JEAN BAPTISTE LE MOYNE (byen-vēl'), a French colonist,

born in Montreal, Feb. 23, 1698. In 1698, with his brother, Iberville, he left France to found a colony at the mouth of the Mississippi. In 1700 he constructed a fort 54 miles above the mouth of the river, and in 1701, at the death of Sauvolle, a second brother, he succeeded to the direction of the colony, the seat of which became Mobile. In 1718 he received a commission as governor of Mississippi, and about this time founded the city of New Orleans. In 1724 he was summoned to France, and, on Aug. 9, 1726, was removed from office. In 1733 he was sent back to the colony as governor, with the rank of lieutenant-general. In 1743 he was again removed and returned to France, where he died in 1765.

BIERSTADT, ALBERT, an American painter, born near Düsseldorf, Germany, Jan. 7, 1830; removed with his parents to Salem, Mass., in 1831; began to paint in oils in 1851; and in 1853 returned to Düsseldorf to study his art, spending a winter in Rome, traveling in Italy and Switzerland, and returning to the United States in 1857. In 1859 he accompanied General Lander's expedition to the Rocky Mountains, and studied mountain scenery. He was elected a member of the National Academy in 1860. In 1861 he finished his painting, "Laramie Peak," and in 1863 "View of the Rocky Mountains—Lander's Peak." These at once gave him a high reputation. He received medals in Austria, Bavaria, Belgium, and Germany, and French, Russian and Turkish orders. Among his best known paintings are "North Fork of the Platte" (1864); "Looking Down the Yosemite" (1865); "Storm on Mt. Rosalie" (1866); "Settlement of California," and "Discovery of the Hudson River," both in the Capitol at Washington; "In the Rocky Mountains" (1871); "Great Trees of California" (1874); "Estes Park, Colorado" (1878); "Storm on the Matterhorn" (1884); "Valley of Zermatt, Switzerland" (1885); "California Oaks" (1886). He died Feb. 18, 1902.

BIES-BOSCH, a marshy sheet of water interspersed with islands, between the Dutch provinces of North Brabant and South Holland, formed in 1421 by an inundation which destroyed 72 villages and 100,000 people.

BIET, ANTONIO (bēt), a French missionary, in 1652 accompanied 600 colonists to Cayenne, where he remained 18 months. He was the author of "Voyages de la France Equinoxiale" (1664), with a Galibi dictionary at the end.

BIÈVRE (byāv're), **MARQUIS DE**, born in 1747; served in the corps of the French musketeers, was a life guard of the King of France, and acquired much reputation by his puns and repartees. He is the author of several amusing publications, including "Le Séducteur," a comedy in verse; an "Almanach des Calembours," or collection of puns. He died in 1789.

BIFFIN, a variety of excellent kitchen apple, often sold in a dry and flattened state.

BIFROST (bēf'rōst), in Northern mythology the name of the bridge represented as stretching between Heaven and Earth (Asgard and Midgard); really the rainbow.

BIGAMY, in civil law: (1) English, the act of marrying a second time, while the first husband or wife is still known to be living. By a law passed in 1276, it was punished with death. In 1603, during the reign of James I., it was made felony, without benefit of clergy. By a law passed in 1794, the capital penalty was modified into imprisonment or transportation. (2) In the United States, the statutory provisions against bigamy or polygamy are in general similar to, and copied from, the statute of James I., excepting as to punishment, and the Congressional legislation against those practicing polygamy as a part of their religious belief. Under the Federal laws, bigamy in the Territories is punishable by imprisonment for not more than 5 years and a fine not exceeding \$500. The different States vary in the punishment attached to the crime. In many States fines are imposed in addition to a prison sentence and a failure to pay the fine results in a lengthening of the sentence.

BIG BETHEL, a village in Virginia, on the peninsula between the York and James rivers; the scene of a battle, June 10, 1861, between the Federal and Confederate forces. It resulted in the defeat of the Federal army with the loss of about 100 men. Maj. Theodore Winthrop was killed in this battle.

BIG BLACK RIVER, a river of Mississippi, flowing into the Mississippi at Grand Gulf. Its valley constitutes a fine cotton region 200 miles long. The name is also applied to Black river, in southeastern Arkansas.

BIG BONE LICK, a salt spring, in Boone co., Ky., 11 miles S. of Burlington, where fossil remains of mastodons and other extinct fauna have been found.

BIGELOW, ERASTUS BRIGHAM, an American inventor, born in Boylston, Mass., April 2, 1814; became a leading manufacturer in Clinton, Mass.; invented looms for suspender weaving, for counterpanes, for coach lace and for carpets; and published a text book on shorthand writing, "The Tariff Question" (1862), and other works. He died in Boston, Dec. 6, 1879.

BIGELOW, JOHN, an American author, born in Malden, N. Y., Nov. 25, 1817; graduated at Union College, in 1835, and became first a lawyer and afterward a journalist. In 1845-1846 he was inspector of Sing Sing prison; in 1849-1861 one of the editors of the New York "Evening Post"; in 1861-1864, United States Consul-General at Paris;



JOHN BIGELOW

and in 1864-1867, Minister to France. He was Secretary of State of New York in 1875-1877. In his will Samuel J. Tilden appointed him his biographer and one of the three trustees of the bulk of his estate, set apart for the establishment of a public library in New York City. Mr. Bigelow was elected President of the consolidated Board of Trustees of the library and appointed Chairman of the Executive Committee. His works include "Molinos the Quietist," "France and the Confederate Navy," "Life of William Cullen Bryant," "Life of Samuel J. Tilden," "Some Recollections of Edouard Laboulaye," "A Life of Franklin." In 1885 he published "The Writings and Speeches of Samuel J. Tilden," and in 1888 "The Complete

Works of Benjamin Franklin," "Retrospection of an Active Life" (1909). He died in 1911.

BIGELOW, JOHN, JR., an American military officer, born in New York, May 12, 1854; son of the preceding; was educated in Paris, Bonn, Berlin, Freiburg, and Providence, R. I.; graduated at the United States Military Academy in 1877; and was assigned to the 10th United States Cavalry. In 1887-1889 was adjutant-general of the militia in the District of Columbia; and in 1894-1898, Professor of Military Science at the Massachusetts Institute of Technology. During the war with Spain he was wounded in the attack on San Juan, Cuba, July 1, 1898. He published "Principles of Strategy"; "Campaigns of Chancellorsville" (1910). Retired from the service in 1904. Professor of French, Massachusetts School of Technology (1904-1910). On staff of Governor of Massachusetts (1906-1910). His later publications include "American Policy" (1914), and "World Peace" (1915).

BIGELOW, POULTNEY, an American author, born in New York, Sept. 10, 1855; son of John Bigelow; graduated at Yale University and at the Columbia Law School in 1882, and was admitted to the bar. In 1875-1876 he took a journey around the world in a sailing ship, which was wrecked on the coast of Japan. He traveled in China, Africa, the West Indies, and Demerara. He has made canoe voyages on the principal waters of Europe, and was the first person to take a canoe through the Iron Gates of the Danube. Emperor William II. was his personal friend since they were students together in Germany. In the World War Mr. Bigelow denounced in print the Emperor's part in bringing on the conflict. He wrote "The German Emperor and His Eastern Neighbors," "Paddles and Politics Down the Danube," "History of the German Struggle for Liberty," "White Man's Africa." Completed his fourth journey round the world in 1906. In 1915 he published "Prussian Memories."

BIG HORN, the *haplocerus montanus* or wild sheep of the Rocky Mountains, named from the size of its horns, which are $3\frac{1}{2}$ feet long, the animal itself being of the same height at the shoulder. The big horns are gregarious, going in herds of 20 or 30, frequenting the craggiest and most inaccessible rocks, and are wild and untamable. It is called also Rocky Mountain sheep.

BIG HORN MOUNTAINS, a range of mountains beginning near the center

of Wyoming and running N. into Montana, containing heights of from 8,000 to 12,000 feet, and covering 7,500 square miles.

BIG HORN RIVER, a river of Montana and Wyoming; rises in the Rocky Mountains near Fremont's Peak, and flows N. E. into the Yellowstone. Along its course is some of the grandest mountain scenery in the world. It is navigable in its lower course, and has a total length of 400 miles.

BIGNONIA, a genus of plants (that of the trumpet flowers), constituting the typical one of the order *bignoniaceæ* or bignoniads. It has four perfect stamens, two long and two short. The species, which are numerous, are nearly all of an ornamental character, owing to their fine, large, trumpet-like, monopetalous corollas, colored red, blue, yellow, or white. They are trees or shrubs, in the latter case often climbing; found in, or sometimes even beyond, the tropics of both hemispheres, and constituting a feature in the flora of the regions which



BIG HORN

they inhabit. Many are from the warmer parts of this country. India also has various species.

BIGNONIACEÆ, an order of plants, ranked by Dr. Lindley as the type of his bignonial alliance. The bignoniads are trees or shrubs, as a rule climbing.

They are highly ornamental plants from the tropics of both hemispheres.

BIG SANDY CREEK. (1) A river of Colorado that flows into the Arkansas, 200 miles long. (2) A river of Indiana, that flows into the Ohio.

BIG SANDY RIVER, a river forming the boundary between West Virginia and Kentucky, and flowing into the Ohio; having two confluent forks, Tug Fork, that rises in West Virginia, and West Fork, that rises in Kentucky. It is navigable for 100 miles of its lower course; flows through a timber and coal region.

BIG SIOUX (sū), a river of South Dakota that flows into the Missouri near Sioux City; it is 285 miles long.

BIG STONE LAKE, a large lake of Big Stone co., Minn., drained by the Minnesota river; it is about 25 miles long.

BIG TREES, the *sequoia gigantea*, See SEQUOIA.

BIHÉ (bē-hā), a fruitful district of South Africa, E. of Benguela, and under Portuguese influence. Bihé is an important caravan center, as the only route across the continent passes through it. Area, 2,500 square miles. Pop. 95,000.

BIJAPUR (bē-jā-pōr'), a decayed city in the Bombay presidency, 160 miles S. E. of Poona. It was for centuries the flourishing capital of a powerful kingdom, but fell therewith under various dynasties in succession, Hindu and Mussulman, till in 1686 it was captured by Aurungzebe. It passed, during the early part of the 18th century, into the hands of the Mahrattas, and became British in 1848. Now that a gradual decay has done its worst, Bijapur presents a contrast perhaps unequaled in the world. Lofty walls of hewn stone, still entire, inclose the silent and desolate fragments of a once vast and populous city.

BIKANER, a native state of Rájputána, India, under the superintendence of a political agent and the governor-general's agent for Rájputána, lying between 27° 12' and 30° 12' N. lat., and 72° 15' and 73° 50' E. long. Area, 23,173 square miles. Pop. about 710,000. Bikaner, the capital, is surrounded by a fine wall 3½ miles in circuit. It has a fort, containing the rajah's palace, and manufactures blankets, sugar candy, pottery, etc. Pop., including suburbs, about 55,000.

BIKELAS, DIMITRIOS (bē-kā'las), a Greek poet and essayist, born at Hemopolis, in the island of Syra, in 1835. After completing his studies, he went to London, and after 1874 lived in Paris. He published a collection of his poems in London in 1862, and made Shakespeare's dramas known in Greece through excellent metrical translations. As a prose writer he won wide reputation with his tale, "Lukis Laras" (1879), which was translated into 13 languages. He died in 1908.

BILASPUR, a district in the chief commissionership of the Central provinces of India, lying between 21° 22' and 23° 6' N. lat., and between 80° 48' and 83° 10' E. long. Area, 7,798 square miles. Pop. about 1,200,000. The administrative headquarters of the district are at Bilaspur, which is also the principal town. It is pleasantly situated on the S. bank of the Arpa, and has a population of about 20,000.

BILBAO, a town of northern Spain, the capital of the Basque province of Vizcaya, is situated in a mountain gorge on the Nervion, 8 miles S. E. of its mouth at Portugalete, and 63 miles N. by E. of Miranda by rail. Bilbao is well built. Pop. about 100,000. Bilbao was founded in 1300 by Diego Lopez de Haro under the name of Belvao—i. e., the fine fort—and soon attained great prosperity. In the 15th century it was the seat of the most authoritative commercial tribunal in Spain. It suffered severely in the wars with France, first in 1795 and again in 1808, when 1,200 of its inhabitants were slaughtered in cold blood. During the Carlist struggles Bilbao stood two great sieges, Zumalacarreguy here receiving his death wound in 1835, while in 1874 the place was vainly besieged and heavily bombarded by the forces of Don Carlos for four months.

BILBERRY, the name given to one or two species of *vaccinium*, a genus of plants belonging to the order *vacciniaceæ* (cranberries). It is especially used of the *vaccinium myrtillus*, called also the whortleberry. It has waxy flowers, greenish with a red tinge, and black berries very pleasant to the taste. It grows in woods and healthy places. The great bilberry or bog whortleberry is an allied species. It grows in mountain bogs. It is also called the bleaberry or blaeberry. The bilberry, properly so called, is eaten in the places where it grows. It is made into jellies and tarts. It is astringent, and may be used in diarrhoea and dysentery. The fruit of

the *V. uliginosum* is acid, and produces giddiness and headache when eaten in too large quantity.

BILBILIS, an old Iberian city of Spain, 2 miles E. of the modern town of Calatayud, in the province of Saragossa, chiefly celebrated as the birthplace of the poet Martial, but also famed for its highly tempered steel blades.

BILE, an animal fluid secreted by the liver. It is collected from venous and not from arterial blood. It is a viscid, transparent liquid of a very deep yellow or greenish color, darkening by exposure to the air. Its odor is disagreeable; its taste nauseous and bitter. It has an alkaline reaction. When the bile is elaborated in the liver, it is received from the secreting vessels by very minute tubes, which, uniting, form the hepatic duct. The bile is conveyed into the gall bladder by means of the cystic, or into the duodenum by the choledoch duct; that which makes its way into the former receptacle is called the cystic bile, and that which enters the latter the hepatic bile. Cystic bile is deeper in color and more viscid, pungent, and bitter than hepatic bile. One main use of bile is to convert chyme into chyle as one step in the process of digestion.

BILED-UL-GERID (-jer'id), a tract of north Africa, lying between the S. declivity of Atlas and the Great Desert, noted for the production of date-palms.

BILGE, the breadth of a ship's bottom, or that part of her floor which approaches to a horizontal direction, on which she would rest if aground. Bilge water, water which enters a ship and lies upon her bilge or bottom. Bilge ways, planks of timber placed under a vessel's bilge on the building slip to support her while launching.

BILHARZIA (*distomum* or *gynæcophorus hæmatobius*), a parasitic flat worm in the fluke or trematode order, and belonging either to the same genus as the common liver fluke (*D. hepaticum*), or to one very closely related. In all other trematodes the sexes are united, the animals are hermaphrodite, but here a grooved canal, formed from two folds of skin on the ventral surface of the larger male, contains the female. Pairs thus united are found in the portal and other vessels in the abdominal region, both in men and monkeys. They are especially abundant in boys, and cause haematuria and other troubles. They occur from Egypt southward to the Cape. It is said that half of the Fel-

lah and Copt population of Egypt suffer from this parasite. The embryos are ciliated, but the life history is not known.

BILIARY CALCULUS, a concretion which forms in the gall bladder or bile ducts; gall stone. It is generally composed of a peculiar crystalline fatty matter which has been called cholesterine.

BILL, a written or printed paper containing a statement of any particulars. In common use a tradesman's account, or a printed proclamation or advertisement, is thus called a bill. In legislation a bill is a draft of a proposed statute submitted to a legislative assembly for approval, but not yet enacted or passed and made law. When the bill has passed and received the necessary assent, it becomes an act.

Bill of Adventure.—A writing signed by a merchant, in which he states that certain goods shipped in his name really belong to another person, at whose risk the adventure is made.

Bill of Attainder.—A bill declaring that the person named in it is attained and his property confiscated. The Constitution of the United States declares that no State shall pass any bill of attainder.

Bill of Costs.—A statement of the items which form the total amount of the costs of a suit or action. This is demandable as a matter of right before the payment of the costs.

Bill of Credit.—A letter sent by an agent or other person to a merchant, desiring him to give the bearer credit for goods or money. It is frequently given to one about to travel abroad, and empowers him to take up money from the foreign correspondents of the person from whom the bill or letter of credit was received.

Bill of Entry.—A written account of goods entered at the custom-house, whether imported or designed for exportation.

Bill of Exceptions.—A bill of the nature of an appeal from a judge who is held to have misstated the law, whether by ignorance, by inadvertence, or by design. This the judge is bound to seal if he be requested by the counsel on either side so to do. The exceptions noted are reviewed by the court to which appeal is taken, and if the objections made to the rulings of the trial judge are well founded, the finding in the case is reversed, and usually the cause is remanded for a new trial.

Bill of Exchange.—A bill or security originally introduced for enabling a merchant in one country to remit money

to a correspondent in the other. It is an open letter of request from one man to another desiring him to pay to a third party a specified sum and put it to the account of the first. In such a transaction, B., the person who writes the bill of exchange, is called the drawer; A., to whom it is written, is termed up to the time that he accepts it, the drawee, and after he has done so, the acceptor; and C., his order, or the bearer—in short, whoever is entitled to receive the money—the payee. The bill may be assigned to another by simple indorsement; the person who thus transfers it is named the indorser, and the one to whom it is assigned the indorsee or holder. Every one whose name is on the back of a bill is responsible if the person on whom payment should legitimately fall fails to meet his engagement. The first bills known in commerce were about A. D. 1328. Bills of exchange are also called drafts.

Bill of Health.—A certificate given to the master of a ship clearing out of a port in which contagious disease is epidemic, or is suspected to be so, certifying to the state of health of the crew and passengers on board.

Bill of Indictment.—A written accusation made against one or more persons of having committed a specified crime or misdemeanor. It is preferred to and presented on oath by a grand jury. If the grand jury find the allegations unproved, they ignore the bill, giving as their verdict, "Not a true bill"; if, on the contrary, they consider the indictment proved, their verdict is a "True bill."

Bill of Lading.—A document by which the master of a ship acknowledges to have received on board his vessel, in good order and condition, certain specified goods consigned to him by some particular shipper, and binds himself to deliver them in similarly good order and condition—unless the dangers of the sea, fire, or enemies prevent him—to the assignees of the shipper at the point of destination, on their paying him the stipulated freight. Usually two or three copies of a bill of lading are made, worded thus: "One of which bills being accomplished, the others stand void." A bill of lading may be transferred by indorsement like a bill of exchange.

Bill of Parcels.—An account given by a seller to a buyer, giving a list of the several articles which he has purchased, and their prices.

Bill of Parliamentary Procedure.—An instrument drawn or presented by a member or committee to a legislative

body for its approbation and enactment. After it has successfully passed both houses and received the constitutional sanction of the chief magistrate, where such approbation is requisite, it becomes a law.

Bill of Particulars.—A paper stating in detail a plaintiff's case, or the set off on defendant's side.

Bill of Rights.—A bill which gave legal validity to the claim of rights, i. e., the declaration presented by the Lords and Commons to the Prince and Princess of Orange on Feb. 13, 1688, and afterward enacted in Parliament when they became King and Queen. It declared it illegal, without the sanction of Parliament, to suspend or dispense with laws, to erect commission courts, to levy moneys for the use of the crown on pretense of prerogative, and to raise and maintain a standing army in the time of peace. It also declared that subjects have a right to petition the King, and, if Protestants, to carry arms for defense; also that members of Parliament ought to be freely elected, and that their proceedings ought not to be impeached or questioned in any place out of Parliament. It further enacted that excessive bail ought not to be required, or excessive fines imposed, or unusual punishment inflicted; that juries should be chosen without partiality; that all grants and promises of fines or forfeitures before conviction are illegal; and, that, for redress of grievances and preserving of the laws, Parliament ought to be held frequently. Finally, it provided for the settlement of the crown. In the United States, a bill of rights, or, as it is more commonly termed in this country, a declaration of rights, is prefixed to the constitutions of most of the States.

Bill of Sale.—A deed of writing, under seal, designed to furnish evidence of the sale of personal property. It is necessary to have such an instrument when the sale of property is not to be immediately followed by its transference to the purchaser. It is used in the transfer of property in ships, in that of stock in trade, or the good-will of a business. It is employed also in the sale of furniture, the removal of which from the house would call attention to the embarrassed circumstances of its owner; hence the statistics of the bills of sale act as an index to measure the amount of secret distress existing in times of commercial depression. In not a few cases bills of sale are used to defeat just claims against the nominal or real vendor of the goods transferred.

Bill of Sight.—A form of entry at the custom-house by which one can land for inspection, in presence of the officers, such goods as he has not had the opportunity of previously examining, and which, consequently, he cannot accurately describe.

BILL BROKER, a financial agent or money dealer, who discounts or negotiates bills of exchange, promissory notes, etc.

BILL FISH, the gar pike or long-nosed gar (*lepidostēus ossēus*), a fish common in the lakes and rivers of the United States; but the name is also given to other fishes.

BILLIARDS, a word probably derived from old French *billiard*, "a stick with a curved end"; in English, introduced as the name of a game, and made plural. The origin of billiards is uncertain. It was brought into fashion by Louis XIV. (middle of 17th century), whose physicians recommended him exercise after eating. Others believe billiards to be of English origin. It is mentioned by Spenser ("Mother Hubbard's Tale," 1591), and by Shakespeare ("Antony and Cleopatra," circa, 1607). The earliest description of billiards in English is in Cotton's "Compleat Gamester" (1674). The bed of the table was then made of oak; sometimes of marble. Slate beds were first used about 1827. The cushions were stuffed with flock; list was used later. India rubber cushions were first manufactured about 1835. The pockets, called hazards, were at first wooden boxes, nets being employed soon afterward. Each player pushed his ball with a mast (now corrupted into mace), made of heavy wood, and tipped at the broad end with ivory. The game played was the white winning game (single pool), five or three up. A player holding his adversary's ball won an end (or life); if he holed his own ball he lost a life (hence the terms winning and losing hazards). In addition, a small arch of ivory, called a port, and an ivory peg or king, stood on the table, and certain scores appertained to passing the port and to touching the king.

Early in the 19th century, the white winning and losing carambole game, now known as billiards, ousted all other varieties in England. It is played on a table 12 feet by 6 feet, surrounded by cushions, and having six pockets, of no fixed size, one at each angle of the two adjacent squares which form the bed of the table: three balls, diameter 2 1-16th inches, are used. The French have long discarded pockets altogether, and play

only a cannon game, with larger balls and a smaller table. The Americans added a fourth ball, and in their game cannons and winning hazards counted to the striker, and losing hazards against him. They then abolished the two side pockets, in consequence of their interfering with cannon play (or, as the Americans still spell it, more correctly, carom). Of late years pocket tables have been but little used in the United States, except for pool; and the size of the table has been gradually reduced to 10 feet by 5 feet; balls 2 1/2 inches in diameter. The four ball game is now seldom played by experts, the three ball French carom game having superseded it in match play. The increasing skill of leading amateur and professional players in the United States has made it necessary to introduce features that make the game more difficult. In championship games 14- and 18-inch balk lines are used for this purpose. In the first, lines are drawn 14 inches from each of the four rails, in the second 18 inches. The eight spaces formed by the lines are the balk. In the 14-inch balk-line game, the object balks are in balk whenever both have stopped in a balk space. Only two shots are allowed under these conditions, and at least one of the balls must be driven out of balk on the second shot or the player has lost his inning. The 18-inch balk-line game has the same rules as the 14-inch, except that, in the former, only one shot is allowed in balk. Any number of shots may be made in the space outside the balk lines.

The United States champion at billiards in 1920 was William Hoppe of Brooklyn, N. Y., who for many years had maintained his supremacy over all competitors.

BILLINGS, a city of Montana, the county-seat of Yellowstone co. It is on the Yellowstone river and on the Northern Pacific, the Great Northern, and the Burlington and Missouri railroads. It is the center of an important stock-raising district and has been for several years one of the largest inland wool markets of the United States. There are flour and lumber mills, beet sugar factories, foundries, brick yards, and other industries. The city has many handsome buildings, including a public library, opera house, a city hall, and a court house. Pop. (1910) 10,031; (1920) 15,100.

BILLINGS, JOHN SHAW, an American surgeon and librarian, born in Switzerland co., Ind., April 12, 1839; was graduated at Miami University, in 1857, and the Ohio Medical College, in 1860;

was demonstrator of anatomy in the last institution, in 1860-1861; entered the Union army as an Assistant Surgeon, in 1861; was promoted to Lieutenant-Colonel and Deputy Surgeon General, June 6, 1864; and was retired, Oct. 1, 1895. He was Professor of Hygiene in the University of Pennsylvania, in 1893-1896; and in the last year was appointed Director of the New York Public Library (Astor, Lenox and Tilden foundations). After the close of the war Dr. Billings took charge of the library in the Surgeon-General's Office; reorganized the United States Marine Hospital Service; was Vice-President of the National Board of Health, in 1879-1882; and had charge of the compilation of vital and social statistics in the Eleventh Census (1890, *et seq.*). He was a member of a large number of American and foreign scientific societies, and his numerous publications include "Principles of Ventilation and Heating," "Index Catalogue of the Library of the Surgeon-General's Office, United States Army" (14 vols.), and "The National Medical Dictionary" (2 vols.); "Some Library Problems of Tomorrow" (1902); "Physiological Aspect of the Library Question" (1903). He died in 1913.

BILLINGS, JOSH. See SHAW, HENRY WHEELER.

BILLINGSGATE, a word said to have been derived from Belinus Magnus, a somewhat mythic British prince, father of King Lud, about 400 B. C. It is applied to the celebrated London fish market existent at least as early as A. D. 979, made a free market in 1699, extended in 1849, rebuilt in 1852, and finally exposed to the rivalry of another market begun 1874, completed 1876. The word is also used to indicate foul, abusive language, such as is popularly supposed to be mutually employed by fish-wives.

BILLION, in English notation 1,000,000 times 1,000,000, and in England it is written 1,000,000,000,000, *i. e.*, with twice as many ciphers as 1,000,000 has. In the United States and in France the notation is different, the word billion signifying only 1,000 millions, written 1,000,000,000.

BILLITON, a Dutch East Indian island between Banca and the S. W. of Borneo, of an irregular, sub-quadrangular form, about 40 miles across. It produces iron and tin, and exports sago, cocoanuts, pepper, tortoise shell, trepang, edible birds' nests, etc. It was ceded to the British in 1812 by the Sultan of Palembang, but in 1824 it was given up to the Dutch. Pop. about 60,000.

BILLON, an alloy of copper and silver, in which the former predominates, used in some countries for coins of low value, the object being to avoid the bulkiness of pure copper coin.

BILMA, a town of the Sahara, central Africa, situated in 18° 40' N. lat., 14° E. long., on an oasis called the Wady Kewar. It is the capital of the Tibu country, important as a resting-place of caravans crossing the desert, but is a poor place.

BILOXI, a city in Harrison co., Miss., on Biloxi Bay, opening into the Gulf of Mexico, and the Louisville and Nashville railroad; 80 miles N. E. of New Orleans. It is principally engaged in the canning of oysters, fish, fruit and vegetables, and has also considerable manufacturing and shipping interests. Biloxi is the site of the first settlement made near the Mississippi by white men, under the direction of Pierre Le Moyne d'Iberville, in 1699. The city has electric lights, artesian waterworks, over 25 miles of shell roads, and an iron lighthouse with a light 62 feet above the sea level; and is a popular summer and winter resort. Pop. (1910) 7,988; (1920) 10,937.

BILOXI INDIANS, the name given to one of the 10 groups of tribes into which the Siouan stock of North American Indians is divided. In 1669 they had one village on Biloxi Bay near the Gulf of Mexico. Thirty years later there were three villages, Biloxi, Paskagula and Moctobi. A few survivors of the tribe are still to be found near Lecompte, Rapides parish, La.

BIMETALLISM, a term invented by Henry Cernuschi and currently used to denote a double monetary standard of value. The idea was first promulgated by Schneidt in 1766 and nearly 100 years later by Schübeler, J. Oppenheim and Ph. Geyer. Bimetallists assert that the exceedingly unsatisfactory condition of the productive industries and of commerce generally is largely due to the appreciation of gold and the violent fluctuations and uncertainty of exchange between gold standard and silver standard countries; and that the best and most effective remedy is to be secured by an agreement, on a broad international basis, to reopen the mints of the leading nations of the world to the unrestricted coinage of both gold and silver. An International Monetary Congress, held at Paris, September, 1889, discussed the subject academically, and an International Monetary Conference, which was convened by the United States, "to consider by what means, if any, the use of silver can be increased in the cur-

rency system of the nations," and which met at Brussels in November, 1892, separated without coming to any conclusion. The currency question in the United States influenced very materially the canvass for the Presidency in 1896. It appeared, as the year wore on, that free silver doctrines had captured a majority of the Democratic party, and at the Chicago Convention (July 7th) this majority adopted a platform demanding "the immediate restoration of the free and unlimited coinage of gold and silver at the present legal ratio of 16 to 1, without waiting for the aid or consent of any other nation," and that "the standard silver dollar shall be full legal tender equally with gold for all debts, public and private." WILLIAM JENNINGS BRYAN (*q. v.*) was nominated for the Presidency, but was decisively beaten by WILLIAM MCKINLEY (*q. v.*), the Republican candidate, who favored a single gold standard, though he pledged himself to promote action by international agreement. To this end he sent commissioners to France, Great Britain and Germany, in 1897, and they, together with the French Ambassador, laid various proposals before the British Government, the chief of which were that the Indian mints should be reopened, and that Great Britain should annually purchase £10,000,000 of silver. The Indian Government, however, declined to agree to the first suggestion, and no action resulted.

Bimetallism has ceased to be a political issue, but the continued tendency of silver to reach a closer parity with gold as a result of conditions during and after the World War was taken by advocates of the theory as a vindication of it.

BINARY ARITHMETIC, a method of notation invented by Leibnitz, but which appears to have been in use in China about 4,000 years ago. As the term binary implies, there are only two characters in this notation; these are 1 and 0. By it, our 1 is noted by 1, our 2 by 10, 3 by 11, 4 by 100; 5 by 101, 6 by 110, 7 by 111, 8 by 1,000, 9 by 1,001, 10 by 1,010, etc. The principle is that 0 multiplies by 2 in place of by 10, as on the common system.

BINARY ENGINE, usually an engine having one cylinder, the piston being impelled by steam, which, having done its work there, is exhausted into another part of the apparatus, where it is allowed to communicate its unutilized heat to some liquid volatile at a lower temperature; the vapor of this second liquid, by its expansion in a second cylinder, yields additional useful force. Ether, chloro-

form, and bisulphide of carbon have all been tried.

BINARY LOGARITHMS, a system of logarithms devised by Euler for facilitating musical calculations. Instead of having, like the common system of logarithms, 1 as the logarithm of 10, and 0.43429448 as the modulus, it had 1 as the logarithm of 2, and the modulus 1.442695.

BINARY STAR, a star which, closely examined by the telescope, is found to consist of two stars revolving around their common center of gravity. In some cases they are colored differently from each other. In 1803 Sir William Herschel discovered that Gamma Leonis, Epsilon Bootis, Zeta Herculis, Delta Serpentis, and Gamma Virginis are revolving double stars, and others, including Castor, have since been added to the list, a large proportion of the later discoveries having been made by Sherburne W. Burnham, Professor of Practical Astronomy in the University of Chicago (1900). The period of revolution in various cases has been determined. It is found to vary from 26 to more than 1,200 years.

BINARY SYSTEM, in zoölogy, a system of classification by which each sub-kingdom, class, order, etc., is perpetually divided into two, the one with a positive and the other with a negative character, till genera are reached. For instance, on this system, the animal sub-kingdom is divided into vertebrata and invertebrata, that is, animals which have, and animals which have not, vertebræ.

BINARY THEORY, in chemistry, a hypothesis proposed by Davy to reduce the haloid salts (as NaCl) and the oxygen salts (as NaNO₃) to the same type, the monad Cl' being replaced by the monad radical containing oxygen (NO₃)'. Acids are hydrogen salts, as HCl, or H(No₃)'. A radical is only part of a molecule which can unite with or replace an element or another radical, atomicity for atomicity. Thus the dyad radical (SO₄)' can replace two monad radicals, (NO₃)'₂, as in the equation Pb" (NO₃)₂ + Mg" (SO₄)" = Pb" (SO₄)" + Mg" (NO₃)'₂. A radical cannot exist in a separate state.

BINGEN (bing'en), a German town in the province of Rhine-Hesse, Hesse; on the left bank of the Rhine, and the right of the Nahe. It is of considerable historical interest, containing the ruins of the Castle of Klopp, blown up by the French in 1689; the remains of a 12th century monastery; and the tower where

Hatto, Archbishop of Mainz, is said to have been eaten alive by mice in the 10th century. A statue of "Germania," heroic size, has been erected here to commemorate the German victories of 1870-1871. Pop. about 9,950.

BINGHAM, MAJOR-GENERAL SIR CECIL EDWARD, a British soldier; born Dec. 7, 1861. He entered the military service in 1882 and rose through the various grades until he reached the rank of Major-General. In the Boer War he served with distinction, being frequently mentioned in dispatches, and in the World War commanded the First Cavalry Division.

BINGHAMTON, city and county-seat of Broome co., N. Y., at the junction of the Chenango and Susquehanna rivers, and on several railroads; 50 miles E. of Elmira. It occupies a site more than 850 feet above tide water, and both rivers are here spanned by several bridges. The city has excellent street, sewer, and water systems. It has libraries, parks, hospitals and banks. The noteworthy buildings include the State Asylum for the Insane, United States Government Building, State Armory, court house, city hall, orphan asylums, the Commercial Travelers' Home, an opera house, and the Casino. The leading industries are the manufacture of boots and shoes, motors, cigars, cotton goods, and clothing. Other important manufactures are scales, chemicals, furniture, sheet metal work, glass, gloves, and refined oils. An interesting feature of the city is the large number of cottages owned by the working people. Binghamton received a city charter in 1867. Pop. (1910) 48,443; (1920) 66,800.

BINNACLE, corrupted from bittacle, a wooden case or box in which the compass on board a ship is kept to protect it from injury. A light is placed within it at night to insure that its indications are seen. It is placed immediately in front of the wheel or steering apparatus, and secured to the deck, usually by metal stays.

BINOCLAR, literally, having two eyes or pertaining to both eyes; an instrument having two tubes, each furnished above with an eyeglass, so as to enable one to see with both eyes at once. Many opera glasses, telescopes, and microscopes are now binocular.

Binocular Eye Piece.—An eye piece so constructed and applied to the object glass as to divide the optical pencil transmitted to the latter, and form, as to each part of the divided pencil, a real or virtual image of the object beyond the place of division.

Binocular Microscope.—A microscope with two eyeglasses, so that both eyes may use it simultaneously.

Binocular Telescope.—A pair of telescopes mounted in a stand, and having a parallel adjustment for the width between the eyes. The tubes have a coincident horizontal and vertical adjustment for altitude and azimuth. The inventor of this instrument is said to have been a Capuchin monk, Schyrieus de Rheiata. Galileo also made a binocular telescope in 1617.

BINOMIAL, literally, having two names.

Binomial System.—A system (that which now prevails) which gives to an animal, a plant, or other natural object, two names, the first to indicate the genus, and the second the species to which it belongs, as *canis familiaris* (the dog), *bellis perennis* (the daisy).

Binomial Theorem.—In algebra, a theorem, or it may be called a law, discovered by Sir Isaac Newton, by which a binomial quantity can be raised to any power without the trouble of a series of actual multiplications. Actual multiplication shows that the 7th power of $x+a$ is $x^7 + 7x^6a + 21x^5a^2 + 35x^4a^3 + 35x^3a^4 + 21x^2a^5 + 7xa^6 + a^7$. It is evident that the several powers of the two letters x and a and the co-efficients stand so related to each other that study of them might enable one to educe a law from them. In its most abstract form it is this: $(x+a)$ be raised to the n th power, that is, $(x+a)^n$, it = $x^n + nx^{n-1}a + \frac{n(n-1)}{1 \cdot 2} x^{n-2}a^2 + \frac{n(n-1)(n-2)}{1 \cdot 2 \cdot 3} x^{n-3}a^3 + \dots$ etc.

BINTANG, an island of the Dutch East Indies, 40 miles S. E. of Singapore. Area 454 square miles; pop. 18,000. Gambir, rice and pepper are exported.

BINTURONG (*arctictis* = bear-marten), a genus of carnivores in the civet section. It is a slow, arboreal and nocturnal animal, partly vegetarian, indeed omnivorous, in its diet, with lank body, coarse, dark hair, long, tufted ears, and prehensile tail. There is but one species (*A. binturong*), found in India, Malay, Sumatra, and Java. Its nature is fierce, but it is frequently kept in captivity.

BINYON, LAWRENCE, British poet, born at Lancaster, Aug. 10, 1869, and educated at Oxford. He took the Newdigate prize in 1890, and entered the British Museum in 1893 as cataloguer of English drawings. He wrote "Lyric Poems," (1894); "Attila" (1907); "England" (1909); "Botticelli" (1913); "Aurigies" (1913); "The Winnowing Fan" (1915).

BIOBIO (byō-byō), the largest river of Chile, has a W. N. W. course of about 200 miles, from near the volcano of Antuco in the Andes to Concepcion on the Pacific Ocean. It is 2 miles wide at its mouth, and navigable for 100 miles. The river, since 1875, has given name to a province with an area of 5,245 square miles, and a pop. over 100,000.

BIOGENESIS, in biology, a word invented by Professor Huxley, and first used by him in his address, as President of the British Association, at Liverpool, 1870, to indicate the view that living matter can be produced only from that which is itself living. It is opposed to abiogenesis. The first who established the doctrine of biogenesis was Francesco Redi. He considered that there were two kinds of it; the first, and by far the most common, that in which the offspring passes through the same series of changes as the parent, and the second, that in which the offspring is altogether and permanently unlike the parent. The former is now called homogenesis and the latter xenogenesis.

BIOGRAPHY, that department of literature which treats of the individual lives of men or women; and also, a prose narrative detailing the history and unfolding the character of an individual written by another. When written by the individual whose history is told it is called an autobiography.

Though the term biography is modern, the kind of literature which it describes is ancient. In the Book of Genesis there are biographies, or at least memoirs of Adam, Noah, Abraham, Isaac, Jacob, Joseph, and others. Homer's "Odyssey" may be considered to be an extended biography of Ulysses, limited, however, to the most interesting period of his life, that of his wanderings. The most elaborate Greek biography was Plutarch's "Parallel Lives" ("Bioi Paralleloi"), consisting of 46 memoirs of Greek, Roman, and other celebrities; it was published about A. D. 80.

Modern biographical literature may be considered to date from the 17th century, since which time individual biographies have multiplied enormously. Dictionaries of biography have proved extremely useful, Moreri's "Historical and Critical Dictionary" (1671), being, perhaps, the first of this class. During the 19th century the most ambitious biographical work to be attempted was Leslie Stephen's "Dictionary of National Biography" (completed in about 60 volumes, the first of which appeared in January, 1885). There followed Appleton's "Cyclopædia of American Biography" (7

vols., 1887-1900); White's "National Cyclopædia of American Biography" (New York); "Men and Women of the Time" (London); Vapereau's "Universal Dictionary of Contemporaries" (Paris); "Lamb's Biographical Dictionary of the United States" (8 vols., 1897, *et seq.*) ; and "Canadian Men and Women of the Time." Other biographical works of reference are "Who's Who" (English); "Who's Who in America" (latest edition 1920), and similar volumes for other countries, and for different classes and professions. Among works of more limited aim may be noted various "Lives of the Saints," Fox's "Book of Martyrs," various "Lives of the Poets," Boswell's "Life of Johnson," etc.

BIOLOGY. The biological sciences are those which deal with the phenomena of living things. They cover an enormous field of scientific activity and as a whole are pretty clearly separated from the abiological sciences. Interest in biology leading to greater knowledge has vastly increased in the last fifty years, has led to numerous subdivisions of the science, and has made it impossible for a single mind to so completely grasp the entire subject as did Huxley. For this reason the single subject is now rarely recognized as a university department and courses of instruction which are designed to give the student some general but accurate knowledge of the forms and activities of living things have not a prominent place in curricula. This is unfortunate, for environment brings man in contact with objects for biological study and whatever his main interest in life, he cannot neglect the influence of biological science upon that interest. Subjects such as psychology, sociology, and history are not generally considered as belonging to biology, but they really do; psychology being closely related to physiology, the phases of sociology exhibited by beings other than man are closely interlinked with those exhibited by man, and history broadly considered is but the influence of environmental conditions upon man. Biological science, though holding a place of its own, has close relation with abiological science which is recognized in physics and chemistry by the creation of departments of biophysics and biochemistry. The relation between physics and chemistry is accentuated in the physics and chemistry underlying and controlling the activities of living things, certain chemical and physical arrangements of matter being found almost exclusively in living matter. The methods of biological science are the same as in all other science, experiment holds the

same foremost place, and the comparative method is of great importance. Living matter has certain characteristics which in their entirety distinguish it from all other forms of matter, but no single one of which is differential.

1. It never occurs in solution, but in insoluble units which are heterogeneous in composition. When these units are of sufficient size to be studied under the microscope, optical difference in refraction can be distinguished in the component material, and this indication of difference is accentuated by coloring the material with selective dyes. The materials in the unit have a certain orderly arrangement giving the conception of differentiated organs, and this is more evident in the higher animals and plants. Living things are known as organisms and organic has become almost synonymous with living. The units of living matter are called cells and these vary in form, structure, and size, some being so large that they can be seen with the unaided eye; others are too small to be seen with the highest power of the microscope. The living thing may be a single cell or in case of the higher animals and plants may be formed of great numbers of cells, those similar in character being combined in masses termed organs which have separate functions but which are co-ordinated with the activity of the organism as a whole.

2. The chemical composition of living material is extraordinarily complex and we are still far from knowing completely its physico-chemical structure. A large number of elements combined to form giant molecules termed proteins is a distinguishing feature. Knowledge of these proteins is obtained from the study of their split products, for they have not been formed synthetically. The smallest living unit must carry out a number of activities, and if we assume that each of these is due to a difference in the character of the material it is difficult in view of the large size of the molecules that they can all be contained in the unit. Recent investigations of the filterable viruses have shown the existence of living units which are not even visible with the ultra-microscope, and pass through filters which hold back large molecules. Knowledge of the chemical composition of living matter is obtained by the study not of living but of dead protoplasm, and it is possible that living activity may be due not so much to chemical composition as to physico-chemical intracellular structure. Living material is generally known as *protoplasm*, the word first being used by Purkinje, 1787-1869, to describe the material of the embryo. Water in large

but variable amounts always enters into the composition of living matter and life is possible only in a fluid environment. Every living cell must be surrounded by or in contact with water, for it is only in this way that substances necessary for its growth can be conveyed to it and products of waste removed. Within the cell it plays an equally important part in making possible chemical changes.

3. All living things, whether represented by the smallest unit or by such a complex organism as man, are individuals and in some way differ from the other individuals of the species. Such individuality may be evidenced either in obvious differences of structure or by differences in reaction. This holds true as far as methods enable us to study individuality, but such studies cannot be made on all the members of a group of the smallest bacteria. This individuality is due to variation in character or arrangement which may be either molecular or atomic, of the living material, for it is impossible to think of precisely the same structure not giving the same reaction in a common environment. On the other hand, every organ in a mass of such an inorganic substance as sodium chloride is of precisely the same character and gives the same reactions.

4. Living matter possesses to a remarkable degree the power of *adaptability* to environmental conditions. Different living things show great differences in this power of adaptation, in some it is extremely limited, certain parasites for instance find a suitable environment only within certain cells of a narrow animal species, while in others life is possible in a wide range of environment. As a rule the more complex the organism the greater is the capacity of adaptation.

5. Living matter undergoes constant change, there is constant chemical decomposition, breaking down of high molecular forms into lower, constant oxidation and formation of CO_2 . Such constant destruction is compensated by equally constant formation of new material. The organism grows when the formative processes more than balance the destructive, and wastes when the reverse takes place. Growth is complicated, for the added material when taken into the cell differs from its substance and must be formed into cell material and organization by the physical and chemical action within the cell. Such growth by intussusception was formerly supposed to distinguish cell growth from growth of crystals, but recent investigations have shown that the distinction is

not absolute. The building material is usually, in part at least, derived from some form of life, save in the case of plants containing chlorophyll which are able by means of light energy to build up complex substances from the simpler, and this power is shared by certain of the bacteria. Certain organisms are able to pass into what is known as latent life, in which all activity ceases, but can be resumed when the environment becomes favorable. This state is associated with great reduction of the water content and the resumption of activity is inaugurated by rapid absorption of water.

6. Relation of temperature to life. All chemical processes in living matter and in most cases life itself are possible only within certain temperature limits. In a condition of latency, temperatures which are destructive to active life can be withstood. The temperature limits within which active life is possible are somewhat above the freezing point of water and somewhat below the point at which albumen coagulates. In the highly organized mammals the temperature limits are narrow and not more than 10° C. The temperature limits for latent life are extremely variable, ranging from 3 to 4 degrees above absolute zero to considerably above the boiling point of water, as shown by the spores of certain bacteria.

7. All living matter undergoes cyclic change. All forms of life come from pre-existing forms. The living thing grows until it reaches the form and size characteristic of the species, remains in this stage for a variable and often very short period, then the processes of destruction overbalance the processes of growth and there is final disruption of structure, or death. The continuation of life is provided for by the separation of parts of the living matter in which again growth overbalances destruction. In some cases this renewal of life is a simple process, in others extremely complicated. From this it is evident that the living thing is to be regarded as a most complicated and intricate chemical mechanism whose activity is due to forces acting upon it from without. There is no force inherent in living matter, there are no vital forces independent of and differing from the cosmic forces; the energy manifested by living matter, whatever its form, is counterbalanced by the energy which it receives. It is perfectly true that we cannot explain certain of the forms of energy which the living matter gives off by comparison with such mechanisms as can be produced, but no other mechanism can be compared in complexity of structure

and range of activity with the living thing. Attempts to bridge the difficulties of comparison of living activity with mechanisms have been made by the use of such terms as vital force, and there is no objection to the use of such terms provided it be understood that by them we merely express ignorance. Nothing is known of consciousness save as the manifestation of a form of vital activity; nor does it seem to be open to investigation by the methods of science. It is not known whether it is a general attribute of living matter. Nor is anything known of the primary origin of life. At some period of the evolution of the earth, hydrogen, oxygen, and carbon may have come together in such combinations as water and carbonic acid as would give combinations with other substances to form protoplasm. The primary difficulty is to explain the origin of protoplasm; given this, evolution will account for all the forms of life. So far as we know living matter is immortal; death is due to the action of conditions which so change its character that the peculiar activities which characterize life are no longer possible. It is not inconceivable that ultra-microscopic forms of life may be originating at the present time.

BION, a Greek pastoral poet, born near Smyrna in the 3d century B. C. He appears to have passed the latter part of his life in Sicily. Still extant is his "Lament for Adonis," often imitated by subsequent poets. Besides this there remain of his works only short pieces, many of them fragmentary.

BIOPLASM, in biology, a term introduced by Prof. L. S. Beale, an English scientist, to designate forming, living, or germinal matter; the living matter of living beings. It is distinguished from formed matter; indeed, the extension of the one and that of the other occur under different and often opposite conditions. All the organs of the body come from bioplasm.

BIOPLAST, in biology, a little nucleus of germinal matter, many of which are scattered through the tissues of the body. It is from these that the growth of new matter proceeds. In the process of healing of a wound near the surface of the body, lymph is poured out, in which may be found bioplasts which have descended from white blood corpuscles. Of these, some produce epithelium, others fibrous connective tissue, unless they be too freely nourished, in which case they grow and multiply rapidly, and no kind of tissue whatever results, but pus is alone formed.

BIOT, JEAN BAPTISTE, a French physicist and astronomer, born in Paris, April 21, 1774. He entered the artillery, but forsook the service for science, and, in 1800, became Professor of Physics in the Collège de France. Along with Arago he was (1806) sent to Spain to carry out the measuring of a degree of the meridian, and, in 1817, he visited England, and went as far N. as the Shetland Islands, in order to make observations along the line of the British arc of meridian. His most valuable contributions to science are on the polarization of light, for which he received the Rumford gold medal in 1840. On astronomy he wrote: "Researches into Ancient Chinese Astronomy" (1840), and "Studies in Indian Astronomy" (1862). His works on physics are "Elementary Treatise on Physical Astronomy" (1841-1857). In 1849 Biot was made a commander of the Legion of Honor; he was also a member of the French Academy. He died in Paris, Feb. 3, 1862.

BIOTITE, a hexagonal and an optically uniaxial mineral, formerly called magnesia mica, hexagonal mica, and uniaxial mica; named after Jean Baptiste Biot. It exists in tabular prisms, in disseminated scales, or in massive aggregations of cleavable scales. Color: silver-white, rarely bottle green, and by transmitted light often fiery red.

BIPED, a descriptive term, sometimes applied to man, but more frequently to birds. It may be used in two ways—(a) in reference to habit only (physiological), when animals use only their two hind limbs for moving along the ground—e. g., man, kangaroo, bird; (b) in reference to anatomy (morphology), when the typical number of four limbs is reduced to two. Thus among mammals the order of whales (*cetacea*) is marked by the absence of hind limbs; among birds the fore limbs are considerably reduced in the running birds of the ostrich sub-class, and especially in the New Zealand kiwi (*apteryx*); among reptiles, some serpents (e. g., *pythons*), retain traces of hind legs, while all the others have lost both pairs, and a few lizards have either only hind feet (*pseudopus*, *ophiodes*), or only fore feet (*chirotes*); among amphibians, a few (e. g., *siren*) have only fore feet; and the same is true of numerous fishes (e. g., among *siluridæ*), and especially of those which live to a large extent in mud.

BICUADRATIC EQUATION, in algebra, an equation raised to the fourth power, or where the unknown quantity of one of the terms has four dimensions. An equation of this kind, when complete, is

of the form $x^4 + Ax^3 + Bx^2 + Cx + D = 0$, where A, B, C and D denote any known quantities whatever.

BIRCH, the English name of the trees and shrubs belonging to the botanical genus *betula*. The common birch (*betula alba*) has ovate-deltoid, acute, doubly serrate leaves. Its flowers are in catkins, which come forth in April and May. It grows best in healthy soils and in Alpine districts. The drooping or weeping birch (*B. pendula*) is a variety of this tree. It grows wild on the European continent and in Asia. The wood of the birch is tough and white. It is used for making brooms; it is often burned into charcoal. The oil obtained from the white rind is used in tanning Russia leather. The Russians turn it to account also as a vermifuge and as a balsam in the cure of wounds. In some countries the bark of the birch is made into hats and drinking cups. The *B. nana*, or dwarf birch, grows in the Highlands of Scotland, in Lapland, etc. It is a small shrub, one or two feet high. The Laplander uses the wood for fuel, and the leaves, spread over with a reindeer's skin, for a bed. *B. lenta* is the mahogany birch, mountain mahogany, sweet birch, or cherry birch of North America. Its leaves are fragrant, and have been used as a substitute for tea. The canoe birch, of which the North American Indians constructed their portable canoes, is the *B. papyracea*.

BIRCH, SAMUEL, an English Orientalist, born in London, Nov. 3, 1813. He entered the British Museum as Assistant Keeper of Antiquities, in 1836, and ultimately became Keeper of the Egyptian and Assyrian Antiquities. He was especially famed for his capacity and skill in Egyptology, and was associated with Baron Bunsen in his work on Egypt. His principal works include "Gallery of Antiquities" (1842); "Catalogue of Greek Vases" (1851); "Ancient Pottery" (1858); "Egypt from the Earliest Times" (1875). He edited "Records of the Past," from 1873 to 1880. He died Dec. 27, 1885.

BIRD, the English designation of the aves, the second class of the sub-kingdom vertebrata, standing between the mammalia (mammals) above, and the reptilia (reptiles) below. While in their warm blood they are more closely akin to the former than to the latter, they approach the latter rather than the former in various points of anatomical structure, especially in their lower limbs. They agree also with reptiles, amphibia and fishes in being oviparous, while the mammalia bring forth their young alive

and suckle them for a time. Birds are feathered bipeds, with wings, used by all but a few aberrant species, for flight. To facilitate this air cells communicating with the lungs permeate the larger bones, and even the huge bills of the hornbill, toucan, etc., the effect being greatly to diminish their weight. The circulation is rapid, the blood warmer than in other vertebrates, and the energy, consequently, great. Huxley, in 1864, separated birds into *saurururæ*, containing only the *archæopteryx*; the *ratitæ*, including the ostrich and its allies; and the *carinatæ*, comprehending all ordinary birds. The oldest bird of which the actual feathered skeleton has been obtained comes from the lithographic slate of Upper Oölitic age, quarried at Solenhofen in Bavaria; it is the *archæopteryx* of Owen. Three specimens of it are known at present: one in Bavaria, the second in South Kensington, London, while the third was sold to the Berlin University Museum, by Herr Haberlein for 80,000 marks. This last specimen of *archæopteryx* has been examined by Prof. Carl Vogt, who considers that it is neither bird nor reptile, but something intermediate between the two. Owen, in 1846, established four species from the London Clay, described from four or five fragments of bones and skulls found in that Eocene deposit. These include a vulture, a kingfisher, and an ostrich. Bones of birds have been met with somewhat plentifully in the Paris gypsum and the Lacustrine Limestone of the Limagne d'Auvergne, both fresh water strata of Eocene age. From the Miocene beds of France have been obtained about 70 species, among other parrots, trogons, flamingoes, secretary birds, and marabout storks, suggesting the present fauna of south Africa. There are birds in the Miocene of the Sewalik Hills in India. Of Post-tertiary species the finest, and also the best known, are the gigantic moas from New Zealand, which seem to have been contemporary with man, though now they are extinct. The yet more massive *xpiornis*, the eggs of which are more than 13 inches in diameter, and equal in capacity to 148 hen's eggs, is found in surface deposits in Madagascar. Thus few fossil birds are known, and those few are mostly from the Tertiary or Post-tertiary rocks.

In heraldry, birds are regarded, some as emblems of the more active, and others of the contemplative, life. Among the terms applied to them are membered, armed and close. When birds are mentioned in blazon, without expressing their species, they should be drawn in the form of the blackbird. See also BOB-O-LINK; CANARY BIRD.

BIRD, CHARLES, an American military officer, born in Delaware, June 17, 1838. He entered the volunteer service in 1861, as First Lieutenant, 1st Delaware Infantry; was promoted Lieutenant-Colonel, 9th Delaware Infantry, in 1864; and was commissioned Colonel of the 1st United States Veteran Infantry, Dec. 24, 1865. On March 2, 1867, he was brevetted First Lieutenant and Captain in the United States army for gallantry in the battle of Fredericksburg, Major for Spottsylvania, and Lieutenant-Colonel for Petersburg, Va. He was appointed a Second Lieutenant, 14th United States Infantry, in 1866; promoted to Major and Quartermaster in 1895; and commissioned a Colonel of United States Volunteers for the war with Spain, in 1898. He became Brigadier-General in the regular army in 1902, and retired in this year.

BIRD-CATCHING SPIDER, a name applied to gigantic spiders of the genera *mygale* and *epeira*, more especially to the *mygale avicularia*, a native of Surinam and elsewhere which preys upon insects and small birds which it hunts for and pounces on. It is about two inches long, very hairy, and almost black; its feet when spread out occupy a surface of nearly a foot in diameter.

BIRD CHERRY, a small tree (the *prunus padus*, etc.). It has pendulous racemes of white flowers, which appear in May, and are succeeded by small, black, drupaceous, cherry-like fruits.

BIRDE, or BYRD, WILLIAM, an English composer, born about 1543; was educated at Edward VI's chapel; became organist at Lincoln Cathedral in 1563, and of the Chapel Royal, London, in 1569. He is best known by his fine canon, "Non Nobis Domine," and a volume of "Sacred Songs." He died in London, July 4, 1623.

BIRD LICE, the common name given to the small parasites so frequently seen infesting birds. Naturalists place them in the insect order *mallophaga*, in immediate proximity to the *anoplura*, which contains the human pediculi.

BIRD LIME, a substance whitish and limy in appearance; used, as its name imports, for capturing birds. It is, in general, manufactured from the bark of the holly, though the berries of the mistletoe, and also the bark, boiled in water, beaten in a mortar, and then mashed, may also be employed for the purpose.

BIRD OF PARADISE, the English designation of a family of conirostral birds—the *paradiseidæ*. They are closely

allied to the *corvidæ* (crows), with which, indeed, they are united by some writers. They have magnificent plumage, especially the males, who can, moreover, elevate quite a canopy of plumes behind their necks. The fable of the phoenix is believed to have been framed from myths current about the birds of paradise.

BIRD SEED, seed for feeding cage birds, especially the seed of *phalaris canariensis*, or canary grass.

BIRD'S EYE, the eye or eyes of a bird. In botany, the name of several plants with small, bright, usually blue, flowers. (1) A widely diffused name for *veronica chamædrys*. (2) A name for a plant, called more fully the birds'-eye primrose. It is the *primula farinosa*. It has pale lilac flowers with a yellow eye. The whole plant is powdered with a substance smelling like musk. It grows in the milder temperate climates of Europe. The American flower bearing the same common name is of a different species, being called by botanists *primula pusilla*. (3) A name sometimes given to the *adonis autumnalis*, and, indeed, to the whole genus *adonis*, more commonly designated "pheasant's eye."

BIRD'S-EYE LIMESTONE, a division of the lower Silurian rocks of North America, apparently equivalent to the Llandeilo Beds, so called from the dark circular markings which stud many portions of its mass, and which have been referred to the impressions of a fucoid (*phytopsis cellulosa*), others regarding them as the filled-up burrows of marine worms.

BIRD'S-EYE MAPLE, curled maple, the wood of the sugar maple when full of little knotty spots, somewhat resembling birds' eyes, much used in cabinet work.

BIRD'S-EYE VIEW, the representation of any scene as it would appear if seen from a considerable elevation right above.

BIRD'S-FOOT, a common name for several plants, especially papilionaceous plants of the genus *ornithopus*, their legumes being articulated, cylindrical, and bent in like a claw.

BIRD'S-FOOT TREFOIL, the popular name of *lotus corniculatus*, and one or two other creeping leguminous plants common in Great Britain. The common bird's-foot trefoil is a common British plant, and is found in most parts of Europe as well as in Asia, north Africa and Australia, and is a useful pasture plant.

BIRD'S-NEST ORCHIS, one of the *orchidæ*, *neottia* or *listera nidus-avis* of Linnæus. The English designation is a translation of the Latin *nidus-avis*. The plant is so called from having its root composed of numerous fleshy fibers aggregated in a bird's-nest fashion.

BIRDWOOD, GENERAL SIR WILLIAM RIDDELL, a British soldier; born in 1865. He was educated at Clifton College and at Sandhurst. He entered the military service as Lieutenant in the Royal Scots Fusiliers in 1883 and quickly rose through the various grades until he was made Major-General in 1911. He served with distinction in the Boer War, and saw service in India. In the World War he commanded the Anzacs at Gaba Tepe, and in the last year of the war was in command of one of the army corps on the western front.

BIRMINGHAM, city and county-seat of Jefferson co., Ala.; at the junction of several trunk railroads; 96 miles N. W. of Montgomery, the State capital. It is at the foot of Red Mountain, which, besides its vast limestone deposits, contains a remarkably large and accessible vein of hematite iron ore; and is also in close proximity to the Warrior, Cahaba and Coosa coal fields. These natural resources have made Birmingham the most important manufacturing city in the South since the close of the Civil War. The city has an extensive waterworks system with a reservoir on Shade's Mountain, 225 feet above the city; is provided with the Waring system of sewerage; and has an exceptional equipment of street railroads connecting it with all important suburban points. Birmingham is served by nine railroad systems, the Alabama Great Southern, Seaboard Air Line, Central of Georgia, Illinois Central, Atlanta, Birmingham and Atlantic, Southern, Frisco, Louisville and Nashville, and Mobile and Ohio. It is in the heart of great coal fields which have an estimated available supply of 68,572,000,000 tons.

Following the 1904 census, the corporate limits of the city were extended to seven times the former area, or from 4,270 acres to 30,881 acres. There are 60 elementary schools, five high schools, beside commercial, technical, and collegiate institutions. The city is under the commission form of government. The net funded debt in 1919 was \$6,035,000. The total assessed value of realty was \$75,000,000; of personalty, \$29,000,000. The ratio of assessment to market value was 50 per cent. The tax rate was 1 per cent. Budget for the year, \$1,445,000. Charitable institutions include St. Vin-

cent's Hospital, Hillman Hospital, Mercy Home, Jefferson Co. Almshouse, and the Boys Industrial School. Birmingham has been called the "Pittsburgh of the South." Every year 70 per cent. of the entire tonnage of Alabama is hauled in and out of the city. There are over 400 mining and manufacturing plants of various kinds, blast furnaces, coke ovens, steel plants, rolling mills, cement factories, chemical works, hollow ware factories, corn and flour mills, sash factories, agricultural implements, packing companies. Its manufactures are over one-sixth of the total for the State.

History.—Birmingham was incorporated as a city in 1871 with a population of less than 1,000. Its noticeable development began in 1880 and its remarkable progress may be said to date from 1890. In 1896 its two largest iron and steel corporations began selling pig iron for export at prices as satisfactory as those obtained on domestic orders; and since then it has had a larger development in the iron and steel industry than any city S. of Pittsburgh. Pop. (1890) 26,178; (1900) 38,415; (1910) 132,685; (1920) 178,270.

BIRMINGHAM, a city of England, on the Rea river near its confluence with the Tame, in the N. W. of Warwickshire, with suburbs extending into Staffordshire and Worcestershire; 112 miles N. W. of London, and 97 S. E. of Liverpool. It is the principal seat of the hardware manufacture in Great Britain, producing metal articles of all kinds from pins to steam engines. It manufactures firearms in great quantities, swords, jewelry, buttons, tools, steel pens, locks, lamps, bedsteads, gas fittings, sewing machines, articles of papier maché, railway carriages, etc. The quantity of solid gold and silver plate manufactured is large, and the consumption of these metals in electroplating is very great. Japanning, glass manufacturing, and glass staining or painting form important branches of industry, as also does the manufacture of chemicals. At Soho and Smethwick in the vicinity of the city are the famous works founded by Boulton and Watt, who there manufactured their first steam engines, where gas was first used, plating perfected, and numerous novel applications tried and experiments made. Among the public buildings are the Town Hall, a handsome building of the classic style, the Free Library, commenced in 1861, the central portion of which was burned down in 1879, when the irreplaceable Shakespeare library, and the collection of books, prints, etc., bearing on the antiquities of Warwickshire, were destroyed; the Midland Institute and

Public Art Gallery, the Council House, etc. There are statues of the Prince Consort, James Watt, Sir Robert Peel, Lord Nelson, Dr. Priestley, Rowland Hill, Sir Joshua Mason, and others. The finest ecclesiastical building is the Roman Catholic Cathedral, a noble Gothic structure. The principal educational establishments are Queen's College, providing instruction in theology, medicine, and arts; a Roman Catholic college (at Oscott); the Royal College for Medicine, Arts, Engineering and Law; the Mason Scientific College, founded by Sir Joshua Mason, 1875, opened 1880, now Birmingham University; and the Free Grammar School, founded by Edward VI., etc. The Reform Act of 1832 made Birmingham a Parliamentary borough with two members; the act of 1867 gave it a third; while the Redistribution Act of 1885 divided it into seven divisions, each sending one member to Parliament. Birmingham is known to have existed in the reign of Alfred, in 872, and is mentioned in the Domesday Book (1086) by the name of Bermengham. Another old name of the town is Bromwycham, a form still preserved very nearly in the popular local pronunciation, Brummagem. Pop. (1919) 861,585.

BIRNAM, a hill in Perthshire, Scotland; once thickly wooded, and made famous by Shakespeare in "Macbeth." It has a magnificent outlook down the Tay valley. Height, 1,580 feet.

BIRNBAUMER WALD, a plateau in the duchy of Carniola, Austria-Hungary. Here, near the Fugidus, Theodosius defeated Arbogast and Eugenius in 394 A. D. It also includes the Roman military post Ad pirum.

BIRNEY, DAVID BELL, an American military officer, born in Huntsville, Ala., May 29, 1825; son of James Gillespie Birney; studied law in Cincinnati, and, in 1848, began practice in Philadelphia. At the outbreak of the Civil War he entered the Union army; in the summer of 1861 was commissioned Colonel of the 23d Pennsylvania Volunteers; and was promoted Major-General, May 23, 1863. He distinguished himself in the battles of Yorktown, Williamsburg, Fredericksburg, Chancellorsville, and Gettysburg. He died in Philadelphia, Pa., Oct. 18, 1864.

BIRNEY, JAMES GILLESPIE, an American statesman and publicist, born at Danville, Ky., Feb. 4, 1792. Though a Southern planter, he emancipated his slaves and became a prominent anti-slavery leader in the South, proprietor and editor of the anti-slavery journal,

"The Philanthropist," etc. He was candidate of the Liberty Party for President in 1840 and 1844. He wrote "Ten Letters on Slavery and Colonization," "Addresses and Speeches," "American Churches the Bulwark of American Slavery." He died at Perth Amboy, N. J., Nov. 25, 1857.

BIRNEY, WILLIAM, an American lawyer, born in Madison co., Ala., May 28, 1819; was educated in Paris; took part in the Revolution of 1848; and was appointed, on public competition, Professor of English Literature in the College at Bourges, France. In 1861 he entered the United States army as a private, and was promoted through all the grades to brevet Major-General. In 1863-1865 he commanded a division. He was attorney for the District of Columbia, and after 1874 practiced law in Washington. He wrote "Life and Times of James G. Birney," "Plea for Civil and Religious Liberty," etc. He died Aug. 14, 1907.

BIRON, CHARLES DE GONTAUT, DUC DE, born in 1562, was Admiral and Marshal of France, and is noted for the friendship which Henry IV. entertained for him, and for his treason toward that monarch. He made his first essays in war under his father, and covered himself with glory at the battles of Arques and Ivry, and at the sieges of Paris and Rouen, by which he acquired the surname of "Thunderbolt of France." The King loaded him with honors, saved his life at the fight of Fontaine Fran^çaise, and made him ambassador to England. Biron entered into a conspiracy with Spain and Savoy against his sovereign; and the plot being revealed by Lafin, who had been its instigator, he was beheaded in 1602.

BIRRELL, AUGUSTINE, an English essayist, born in Wavertree, near Liverpool, Jan. 19, 1850. He graduated from Cambridge and was called to the bar. He is author of charming critical and biographical essays on literary subjects, collected in the two series of "Obiter Dieta" (1884, 2d series 1887) and "Res Judicatae" (1892), really the third of the same series). "Men, Women and Books" (1895) is a collection of short newspaper pieces. In 1885 he published a "Life of Charlotte Bront^e"; in 1897 edited Boswell's "Life of Johnson," "Life of Sir Frank Lockwood" (1898); "Collected Essays" (1900); "William Hazlitt" (1902); "In the Name of the Bodleian" (1905). President Board of Education, 1905; Chief Secretary for Ireland, 1907-1916. The Irish Rebellion which broke out in Dublin in April, 1916,

led to his resignation in May of that year.

BIRS NIMRUD, a famous mound in Babylonia, on the W. side of the Euphrates, 6 miles S. W. of Hillah, generally identified as the remains of the Tower of Babel.

BIRTH, or LABOR, in physiology, is the act by which a female of the class mammalia brings one of her own species into the world. When the fetus has remained its due time in the womb, and is in a condition to carry on a separate existence, it is extruded from its place of confinement, in order to live the life which belongs to its species, independently of the mother. The period of gestation is very different in different animals, but in each particular species it is fixed with much precision. At the end of the 39th or the beginning of the 40th week, the human child has reached its perfect state, and is capable of living separate from the mother; hence follows in course its separation from her, that is, the birth. An artificial birth is that which is accomplished by the help of art, with instruments or by the hands of the attendant. Premature birth is one which happens some weeks before the usual time, namely, after the seventh and before the end of the ninth month. Late birth is a birth after the usual period of 40 weeks. Although this is considered the usual time for legitimate births, the practice of the English law courts is to allow a longer time when the opinions of the faculty, or the peculiar circumstances of the case, are in favor of a protracted gestation.

BIRTH-RATE, the proportion of births in a given number of inhabitants. For some years it has been evident to students of vital statistics that the birth-rate was steadily decreasing in nearly all European countries.

Table No. 1 gives the births and birth-rates in the birth registration area of the United States from 1915 to 1918, inclusive. The registration area includes only those States in which such records are kept. Table No. 2 gives the birth-rate in the United Kingdom for the years 1913, 1917, and 1918. These years are selected in order to show the effect of the World War on the birth-rate in Great Britain. Birth-rates for other countries since the end of the World War are not available, but it may be stated in general that the effect of the war was to reduce greatly the rate in all countries which participated in it.

Births and rates per 1,000 population in the birth registration area of the United States for the years 1915 to 1918.

Year	Estimated population as of July 1	Births	Rate per 1,000 population
1915.....	31,150,803	776,304	24.9
1916.....	33,013,280	818,983	24.8
1917.....	55,033,195	1,353,792	24.6
1918.....	55,813,339	1,363,649	24.4

Birth-rates per 1,000 population.

Country	1913	1917	1918
United Kingdom....	24.1	18.2	18.1
England and Wales..	24.1	17.8	17.7
Scotland.....	25.5	20.1	20.2
Ireland.....	22.8	19.7	19.9

BIRTHRIGHT, any right or privilege to which a person is entitled by birth, such as an estate descendible by law to an heir, or civil liberty under a free constitution. See PRIMOGENITURE.

BIRTHROOT, a name of *trillium erectum* and other American plants of the same genus, having roots said to be astringent, tonic, and antiseptic.

BIRTHWORT, the English name of the plant genus *aristolochia*. Both the scientific and the English names arose from the belief that the species are of use as a medicine in childbirth.

BIRU, a kingdom of the Sudan, western Africa, bounded on the E. by the Niger. The capital is Walata.

BISBEE, a town of Arizona, in Cochise co., 30 miles S. of Tombstone. It is served by a branch line of the El Paso and Southwestern railroad, a feeder of the Southern Pacific, with which it connects at Benson. Its interests are mineral, chiefly copper, gold, silver, and lead. It has a public library and two hospitals. Pop. (1910) 3,266; (1920) 9,205.

BISCAY, or **VIZCAYA**, the most northerly of the Basque provinces of Spain, is bounded N. by the Bay of Biscay, E. and S. by its sister provinces, Guipuzcoa and Alava, and W. by Santander. It has an area (very mountainous in the S.) of 836 square miles. Chief town, Bilbao. Pop. (1917) 380,668.

BISCAY, BAY OF, that portion of the Atlantic Ocean which sweeps in along the N. shores of the Spanish Peninsula in an almost straight line from Cape Ortegal to St. Jean de Luz, at the W. foot of the Pyrenees, and thence curves N. along the W. shores of France to the island of Ushant. Its extreme width is about 400 miles, and its length much about the same. The depth of water varies from 20 to 200 fathoms, being greatest along the N. shores of

Spain. The whole of the S. coast is bold and rocky, and great parts of the French shores are low and sandy. The bay receives numerous unimportant streams from the mountains of Spain, and, through the rivers Loire, Charente, Gironde, and Adour, the waters of half the surface of France. Its chief ports are Santander, Bilbao, and San Sebastian, in Spain; and Bayonne, Bordeaux, Rochefort, La Rochelle, and Nantes, in France.

BISCHOFF, MOUNT, a post-town of Tasmania, 60 miles W. of Launceston, which owes its existence to the discovery here in 1872, by James Smith, of some of the richest tin mines in the world. Between 1884-1886 more than 20,000 tons of tin ore had been mined. The yield of pure tin from the ore is from 70 to 80 per cent. The mount takes its name from the chairman of a land company (1828). There is railway communication with Emu Bay, 45 miles distant.

BISCUIT, in general language, thin flour cake which has been baked in the oven until it is highly dried. There are many kinds of biscuits, but the basis of all is flour mixed with water or milk. In fancy biscuits, sugar, butter, and flavoring ingredients are used. Plain biscuits are more nutritious than an equal weight of bread, but owing to their hardness and dryness, they should be more thoroughly masticated to insure their easy digestion.

In pottery, articles molded and baked in an oven, preparatory to the glazing and burning. In the biscuit form, pottery is bibulous, but the glaze sinks into the pores and fuses in the kiln, forming a vitreous coating to the ware.

BISHARIN, a race inhabiting Nubia, between the Nile and the Red Sea, somewhat resembling the Bedouins, and living by pasture. They are Mohammedans by religion; in character they are said to be cruel and treacherous. Personal property does not exist among them, the family or the tribe having the ownership.

BISHOP, an ecclesiastical functionary in the apostolical churches. The term *presbyteros* was borrowed from the synagogue; etymologically it implied that, as a rule, the person so designated was pretty well advanced in life, while *episkopos*, borrowed from the polity of the Grecian states, pointed to the duty incumbent on him of overseeing the church. The qualifications of a New Testament bishop are given at length by St. Paul (1 Tim. iii: 1-7; Titus 1: 7-9).

In the post-apostolic period a bishop was the church functionary superior to,

and ruling over, the elders or presbyters. At the deliberations held by the presbyters of Philippi, of Miletus, or other Christian churches, in all probability, one of their number was voted into the chair. Times of persecution bring the strongest to the front, and that strong man would, at nearly every crisis, preside over his fellows. A distinctive appellation was required to discriminate him from his colleagues, and gradually he monopolized the term *episkopos*=overseer or bishop, leaving the humbler designation of *presbyteroi*=presbyters or elders, to his former equals.

In modern times, and in England, a bishop is a spiritual overseer ranking beneath an archbishop, and above the priests or presbyters and deacons of his diocese, but his jurisdiction is territorial, not personal. Before a bishop can be consecrated he must be 30 years of age. The Established Church of England is Episcopal, and of its 40 bishops (1920) 24 sit in the House of Lords. They are technically called lords spiritual, but are not considered peers of the realm; they are only lords of Parliament, nor is their dignity hereditary. They rank in precedence below viscounts and above barons. Their style is the Right Rev. The Lord Bishop of _____, and they are addressed as My Lord. Among the spiritual duties which they discharge are the confirmation of young people prior to their partaking of the communion, the ordination of priests and deacons, the consecration of churches and of burial grounds, the institution or collation to vacant churches, with a general superintendence of morals and doctrine of the clergy.

In the United States a bishop is the highest dignitary, the chief pastor, in the Greek Catholic and Protestant Episcopal Churches. These bishops generally claim to be successors of the apostles. In the Methodist Episcopal, and other evangelical Churches, the office of the bishop is maintained, but with less of formal dignity and without any claim to apostolic succession. All Catholic bishops claim direct apostolic succession.

Bishops in partibus infidelium (in parts occupied by the infidels), in the Roman Catholic Church, are bishops consecrated in succession to those who were the actual bishops in places where Christianity has become extinct, or almost so, through the spread of Mohammedanism, as in Syria, Asia Minor, and the N. coast of Africa. Such titles are given to missionary bishops in countries imperfectly Christianized, and were formerly given to the Roman Catholic bish-

ops in Great Britain, the bishop of the northern district of Scotland, for instance, up to 1878 having the title of Bishop of Nicopolis.

Suffragan bishops are bishops consecrated to assist other bishops in discharging the duties of their dioceses, though any bishop is a suffragan in relation to his archbishop.

BISHOP, SIR HENRY ROWLEY, an English composer, born in London in 1780; was trained under Bianchi, composer to the London Opera House. From 1800, he composed about 100 works for the stage—among others the music of "Guy Mannering," "The Slave," "The Miller and His Men," "Maid Marian," "The Virgin of the Sun," "Aladdin," "Hamlet," versions of operas by Rossini, Meyerbeer and others, "Waverley," "Manfred," etc. From 1810 to 1824 he was musical composer and director to Covent Garden Theater. He also arranged several volumes of the National melodies. In 1841 he became Professor of Music in Edinburgh University, and in 1848 in the University of Oxford. He died in London, April 30, 1855.

BISHOP, ISABELLA BIRD, an English author and traveler, born in Yorkshire about 1832; made her first trip abroad 1855, when she visited Prince Edward's Island and United States, and has since circumnavigated the globe three times. She spent much time in Japan, and in 1894-1895 made her third trip to Korea. She was in Seoul when the war broke out, 1894, and was the first person whose war correspondence reached London. Her publications include "Six Months in the Sandwich Islands" (1873); "A Lady's Life in the Rocky Mountains" (1874); "Unbeaten Tracks in Japan" (1880); "Journeys in Persia and Kurdestan" (1892); "Among the Tibetans" (1894); "Korea and Her Neighbors" (1898); "The Yangtze Valley" (1899); etc. She died in 1904.

BISHOP, MAJOR WILLIAM AVERY, a Canadian aviator, born in 1885. He was a member of the Canadian military establishment in 1911, and went to France with the first expeditionary force at the outbreak of the World War. He joined the aviation arm, and soon became known as one of the most daring and successful airmen on the Allied side. He had numberless hairbreadth escapes and brought down a larger number of German machines than any other aviator who served in the war. He won the Victoria Cross by his exploits. He wrote "Winged Warfare; Hunting the Hun in the Air" (1918).

BISHOP BARNABY, the may-bug or lady-bird.

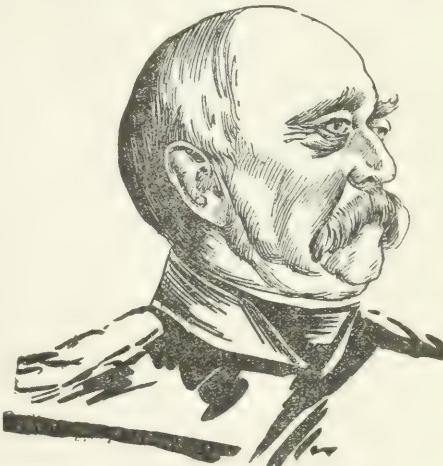
BISHOP-WEED (*ægopodium podagraria*), an umbelliferous plant of Europe, with thrice-ternate leaves and creeping roots or underground stems, a great pest in gardens from its vigorous growth and the difficulty of getting rid of it; called also goutwort.

BISMARCK, city, capital of the State of North Dakota, and county-seat of Burleigh co.; on the Missouri river, and the Northern Pacific and the Minneapolis, St. Paul, and Sault Ste. Marie railroads, 194 miles W. of Fargo. It contains the State Capitol (which cost over \$500,000), the State Penitentiary, court house, city hall, opera house, a State Hospital for the Insane, St. Paul Seminary, U. S. Indian School. The river is here spanned by a bridge that cost \$1,500,000. Bismarck has improved waterworks, electric lights, several flour mills, a National bank, the State Library. The city is a supply and trade center for an extensive agricultural section. Pop. (1910) 5,443; (1920) 7,122.

BISMARCK-SCHÖNHAUSEN (biz'-mark-shén'-houz-en), **OTTO EDUARD LEOPOLD, PRINCE VON**, a German statesman, born at Schönhausen, Prussian Saxony, April 1, 1815. He received his university education at Göttingen, Berlin, and Greifswald. Before 1847 he was little heard of, but began to attract attention in the new Prussian Parliament as an ultra royalist. He opposed the scheme of a German Empire as proposed by the Frankfort Parliament of 1849. His diplomatic career began in 1851, when he was appointed Prussian member of the resuscitated German Diet of Frankfort. In the Diet, he gave open expression to the long-felt discontent with the predominance of Austria, and demanded equal rights for Prussia. He remained at Frankfort till 1859, when he beheld in the approach of the Italian War an opportunity of freeing Prussia and Germany from the dominance of Austria. In the spring of 1862 King William, on the urgent advice of the Prince of Hohenzollern, transferred Bismarck as ambassador to Paris, in order to give him an insight into the politics of the Tuileries. During his short stay at Paris Bismarck visited London, and had interviews with the leading politicians of the time, including Lord Palmerston and Mr. Disraeli. In the autumn Bismarck was recalled, to take the portfolio of the Ministry of Foreign Affairs, and the presidency of the Cabinet. Not being able to pass the reorganization bill and the budget, he closed the

Chambers (October, 1862), announcing to the Deputies that the King's Government would be obliged to do without their sanction. The death of the King of Denmark reopened the Schleswig-Holstein question, and excited a fever of national German feeling, which Bismarck was adroit enough to work so as to aggrandize Prussia by the acquisition of the Elbe Duchies.

The action of France in regard to the candidature of Prince Leopold of Hohenzollern for the throne of Spain gave Bismarck the opportunity of carrying into action the intensified feeling of unity among Germans. During the War of 1870-1871, Bismarck was the spokesman of Germany; he it was that in February, 1871, dictated the terms of peace to



PRINCE OTTO VON BISMARCK

France. Having been made a Count in 1866, he was now created a prince and Chancellor of the German Empire. Following the Peace of Frankfort (May 10, 1871), the sole aim of Bismarck's policy, domestic and foreign, was to consolidate the young empire of his own creating. Thus, conceiving the unity of the nation and the authority of its government to be endangered by the Church of Rome, and its doctrines of Papal infallibility, he embarked on that long and bitter struggle with the Vatican, called the Kulturkampf, in the course of which the Imperial and Prussian Parliaments passed a series of most stringent measures (Falk or May laws) against the Catholic hierarchy. But Bismarck had underrated the resisting power of the Roman Church, and motives of political expediency gradually led him to modify or repeal the most oppressive of the anti-papal edicts. Otherwise his domes-

tic policy was marked, among other things, by a reformed coinage, a codification of law, a nationalization of the Prussian railways (as a preliminary step to Imperial state lines), fiscal reform in the direction of making the Empire self-supporting (*i. e.* independent of matricular contributions from its component states), repeated increase of the army and the regular voting of its estimates for seven years at a time (military septennate), the introduction of a protective tariff (1879), and the attempt to combat social democracy.

In 1884 Bismarck inaugurated the career of Germany as a colonizing power, a new departure which brought him into sharp but temporary conflict with the England of Gladstone. For the rest, his foreign policy mainly aimed at isolating France and rendering her incapable of forming anti-German alliances. On the other hand, he gradually combined the central powers of Europe into a peace league, aiming at counteracting the aggressiveness of Russia and France, separately or combines, on the Danube or the Rhine. The nucleus of this peace league was formed in 1879 by the Austro-German Treaty of Alliance (published in February, 1888), which Italy formally joined in 1886, and which entitles Bismarck to be called the "peacemaker" and the "peacekeeper" of Europe, a character he first publicly acquired when, as "honest broker" between Austria and Russia, he presided over the Berlin Congress in 1878. The phrase, "man of blood and iron," is based on the Iron Chancellor's own use of the words in a speech in 1862.

Bismarck's life was often threatened, and twice actually attempted—once at Berlin in 1866, just before the Bohemian campaign, by Ferdinand Cohen (or Blind), a crazy youth who aimed at making himself the instrument of popular dissatisfaction with Bismarck, as the champion of absolutism, and again in 1874 at Kissingen, by a Catholic tinsmith named Kullmann.

Emperor William died on March 9, 1888. The short reign of Emperor Frederick followed and then his son William II. ascended the throne. On March 18, 1890, Bismarck fell. The main causes for his fall were undoubtedly: that the ambitious young ruler wanted a free hand, and was not in sympathy with many of Bismarck's plans, while the latter would not tolerate the Emperor's direct consultation with other Ministers. After the war with Denmark, King William had made Bismarck a Count. After the conquest of France Emperor William had named him Prince. Emperor William

II. gave him the title of Duke of Lauenburg. When Bismarck's 81st birthday was celebrated in 1896, there was talk of a reconciliation between the Prince and his sovereign. The Emperor sent his photograph to Bismarck, the latter returned thanks, and little by little the way was paved for a meeting between the two men, and eventually for the state visit which the Emperor paid to Bismarck at Friedrichsruhe, where the statesman died July 30, 1898.

BISMARCK ARCHIPELAGO, the name officially given by Germany to New Britain, New Ireland, New Hanover, and several smaller adjoining islands in the South Pacific, since in 1884 they became a German dependency. By the terms of the Peace Treaty of 1919, Australia, through Great Britain, received a mandate for these islands.

BISMUTH, a triad metallic element, Sym. Bi; At. Wt. 210; found associated with the ores of nickel, cobalt, copper and silver, in Saxony, Austria, Peru, Australia and Bolivia. Bismuth is usually found in a metallic state, and is readily obtained from the ores containing it on account of its low fusibility (266° C.). Bismuth forms a dioxide Bi_2O_2 , a trioxide Bi_2O_3 , and a pentoxide Bi_2O_5 . The so-called tetroxide Bi_2O_4 is said to be a compound of the last two oxides. Bismuth forms one choride BiCl_3 , bismuthous choride.

Bismuth is known by its reddish color and crystalline structure. On account of its brittleness it is unfit for use in the metallic state, by itself, except in the construction of thermo-electric piles. The use of bismuth in alloys depends on its low melting point, and its property of expanding upon solidification. It is used in type metal and in several solders. Bismuth is used for pharmaceutical purposes in form of subnitrate of bismuth, carbonate of bismuth, and oxide of bismuth, which, taken internally, act as sedatives on the stomach, in dyspepsia and chronic vomiting. They have been also used in epilepsy and in diarrhoea attending phthisis. Preparations of bismuth are sometimes employed externally as cosmetics, but when a sulphuretted gas acts upon them they blacken the face.

BISON, the name given to two species of ruminating animals belonging to the ox family; (1) the aurochs; (2) an analogous species, now nearly extinct, but once in countless herds roaming over the N. W. plains of the United States. Bisons have proportionately a larger head than oxen, with a conical hump be-

tween the shoulders and a shaggy mane. Two species are known:

1. *Bison americanus*, or *bonasus americanus*, the American bison, popularly but erroneously called the buffalo. It has 15 ribs on each side, while the European bison has but 14, and the domestic ox 13. These animals once roamed in herds in the western parts of Canada and the United States. The only representatives of the species at the present day being a small herd gathered and protected by the United States Government in the Yellowstone National Park, a few individuals in the more remote Canadian regions, and still other small numbers of them grouped in zoölogical collections, such as that at Lincoln Park, Chicago; the Agricultural Fair Grounds, St. Louis; Zoölogical Garden, New York City, etc.

2. *Bison priscus*, sometimes called *bonasus bison*, the European bison. It is the *bonassos* or *bonasos* of Aristotle, the *bison* of Oppian, the *bison jubatus*, and the *bonasus* of Pliny, the *bos bison* of Linnæus, and the *bison europaeus* and *priscus* of Owen. It is often called the aurochs, which is etymologically the same word as Cæsar's *urus*, but the two species are distinct. Cæsar's ox is best distinguished as the urox, leaving the word aurochs to be monopolized by the European bison. The urox was a genuine *bos*, the *bos urus* or *primogenius*, which Prof. Boyd Dawkins believes to have been a giant variety (and no more) of the ordinary *bos taurus*. The European bison was once a British animal, though now found only fossil.

BISPHAM, DAVID S., an American baritone; born in Philadelphia in 1857. He was gifted with a remarkably strong and mellow baritone voice and cultivated it with assiduity, making his debut as the Duc de Longueville in the "Basoche," Royal English Opera in 1891. He filled important engagements with English and American opera companies, singing leading rôles in German, French, and Italian, as well as English. In his later years he became best known as a concert singer.

BISSAGOS ISLANDS, a group of small volcanic islands, about 30 in all, off the W. coast of Africa, opposite the mouth of the Rio Grande. The islands are inclosed by a reef, and, with a few exceptions, are thickly wooded; many of them are densely peopled. There are several fine ports, but the climate is excessively dangerous for Europeans. The principal islands belong to the Portuguese, whose governor resides at Bolama.

BISSÃO (bis-ä'-ö), an island and Portuguese station closer to the African coast than the Bissagos.

BISSING, BARON MORITZ FERDINAND VON, a German general and administrator, Governor-General of Belgium during first three years of the war; born in Bellmannsdorf, Silesia, Jan. 30, 1844. He entered the army at the age of 19 and served during the war between Prussia and Austria in 1866, and the Franco-Prussian war, 1870-1871. He retired in 1908, at which time he held the rank of General. He was recalled into the service after the war broke out, and in November, 1914, was made Governor-General of Belgium, then in German possession. He ruled the people with an iron hand.

BISTINEAU, a navigable lake in N. W. Louisiana; 25 miles long by 2 miles wide; discharges into the Red river.

BISTORT, the English name given to a sub-genus or subdivision of the genus *polygonum*. Two well-known weeds fall under it—the *polygonum bistorta* (common bistort or snakeweed), and the *P. viviparum*, or viviporous Alpine bistort. Each has a simple stem, and a single terminal raceme of flowers. The former has flesh-colored flowers, and is common; the latter has paler flowers, and is a mountain plant. It is sometimes called Alpine bistort.

BISTOURY (from Pistoja, anciently called Pistorium, a city in Italy, 20 miles N. W. of Florence, where these knives were made at an early period), a surgical instrument used for making incisions. It has various forms—one like a lancet, a second called the straight bistoury, with the blade straight and fixed in a handle; and a third the crooked bistoury, shaped like a half moon, with the cutting edge on the inside.

BISTRE, a pigment of a transparent brown color, derived from the soot left after beechwood has been burned.

BITLIS, town of Asia Minor and capital of the former Turkish vilayet bearing the same name, situated on the Bitlis Chai, a tributary of the Tigris. The beginnings of the town date back to the time of Alexander the Great, to whom is attributed the building of a castle now in ruins that dominates the town. It is situated about 5,000 feet above the level of the sea, and is a place of considerable strategic importance. The inhabitants are composed of Turks and Armenians, the latter having most of the trade of the district of which the town is the commercial center. The principal articles of

trade are fruits, manna, gum, spices, arms, wool, and tobacco. In the course of the World War it was occupied by the Russian armies on March 2, 1916. It has been the scene of terrible massacres of the Armenian inhabitants, a large number of whom have been exterminated or deported. It is included within the territory of the new Republic of Armenia created by the decision of the Peace Conference. Before the war it had a population of about 36,000.

BITTER, KARL THEODORE FRANCIS, an American sculptor; born in Vienna, Austria, in 1867. After studying at the Vienna Academy he came to America in 1889, where he soon rose to eminence as a sculptor. The work on the main buildings at the Chicago Exposition was executed by him, and he supervised similar work at the Expositions of Buffalo, St. Louis, and San Francisco. He has decorated many notable buildings in New York and other large cities. Equestrian statues have been made by him which have elicited high praise, such as those of General Franz Sigel and Carl Schurz in New York. He received many medals and decorations and was a member of a number of Art Societies. He died April 10, 1915.

BITTER ALMOND, the bitter variety of *amygdalus communis*, or common almond.

BITTER APPLE, a name applied to the bitter gourd.

BITTER ASH, a tree, *simaruba amara*, a native of the West Indies, the bark of which is used as a tonic. Others of the same genus have also the same name, *S. excelsa* of Jamaica having wood almost as bitter as quassia, and being called Jamaica quassia.

BITTER GOURD, a plant, *citrullus colocynthis*, called also colocynth.

BITTER KING, the *soulamea amara*, a tree of the quassia order peculiar to the Moluccas and Fiji Islands, the root and bark of which, bruised and macerated, are used in the East as an emetic and tonic.

BITTER LAKES, salt lakes on the line of the Suez canal.

BITTERN, the English name for the birds of the genus *botaurus*, and especially for the common one, *botaurus stellaris*. The bitterns are distinguished from the herons proper, besides other characteristics, by having the feathers of the neck loose and divided, which makes it appear thicker than in reality it is. They are usually spotted or

striped. The species are widely distributed, the best known being *botaurus lentiginosus*, *B. stellaris*, and *B. minutus*, inhabiting the temperate portions of both hemispheres. *B. stellaris* is in some localities named the "mire drum" or the "bull of the bog," etc., in allusion to its



BITTERN

bellowing or drumming noise about February or March, during the breeding season. It is about 2½ feet long. The general color of its plumage is dull, pale yellow, variegated with spots and bars of black. The feathers of the head are black, shot with green; the bill and legs are pale green; the middle claw is serrated on the inner edge. It is nocturnal. It frequents wooded swamps and reedy marshes. *B. minutus* is much smaller. *B. lentiginosus* is common in this country.

BITTERN, a name given to the mother liquid obtained when sea water is evaporated to extract the salt (NaCl). Bittern contains sulphates of magnesium, potassium and sodium, also bromides. It is used as a source of bromine. Under the name of oil of salt, it is sometimes used to relieve rheumatism.

BITTER NUT, a tree of North America, of the walnut order, the *carya amara*, or swamp hickory, which produces small and somewhat egg-shaped

fruits, with a thin, fleshy rind; the kernel is bitter and uneatable.

BITTER ROOT, *lewisia rediviva*, a plant of Canada and part of the United States, order *mesembryaceæ*, so called from its root being bitter though edible, It bears a solitary rose-colored flower. The plant appears above ground for only about six weeks. California bitter-root (*echinocystis fabacæa*) and Natal bitter-root (*gerrardanthus macrorhiza*) both belong to the gourd family.

BITTER ROOT MOUNTAINS, a range of the Rocky Mountains, in Montana, deriving its name from a plant with rose-colored blossoms, whose slender roots are used by the Indians for winter food. The chief summits are Lolo Peak and St. Mary's Peak.

BITTER ROOT RIVER, a tributary of the Columbia in Montana, flowing N. into Clark's river in Missoula county; length about 110 miles. Gold has been found in this region.

BITTER ROOT VALLEY, on the E. of the Bitter Root Range, in Montana, is 90 miles long and 7 miles wide, enwalled by lofty mountains, and abounding in farms and cornfields.

BITTER SALT, Epsom salt, sulphate of magnesia.

BITTER SPAR, rhomb-spar, the crystallized form of dolomite or magnesian limestone.

BITTER SWEET, the woody nightshade, *solanum dulcamara*.

BITTER VETCH, a name applied to two kinds of leguminous plants, (a) *ervum ervilia*, a lentil cultivated for fodder; and (b) all the species of *orobus*, e. g., the common bitter vetch of Great Britain, *O. tuberosus*, a perennial herbaceous plant with racemes of purple flowers and sweet, edible tubers.

BITTER WOOD, the timber of *xylopia glabra* and other species of *xylopia*, order *anonaceæ*, all noted for the extreme bitterness of the wood. The name is also given to other bitter trees, as the bitter ash.

BITTER-WORT, yellow gentian (*gentiana lutea*).

BITUMEN, a mineral substance, remarkable for its inflammability and its strong, peculiar odor; generally, however, supposed to be of a vegetable origin. The name, which was in use among the ancient Romans, is variously employed, sometimes to include a number of the substances called mineral resins, particularly the liquid mineral sub-

stances called naphtha and petroleum, or mineral oil, and the solid ones called mineral pitch, asphalt, mineral caoutchouc, etc.

BITUMINOUS COAL, coal which burns with a yellow, smoky flame, and on distillation gives out hydrocarbon or tar. It contains from 5 to 15, or even 16 or 17 per cent. of oxygen. See COAL.

BITUMINOUS SCHIST, schist impregnated with bitumen; occurs in the Lower Silurian rocks of Russia. Sir R. Murchison considered that it arose from the decomposition of the fucoids imbedded in these rocks.

BITUMINOUS SHALE, an argillaceous shale impregnated with bitumen, which is very common in the coal measures.

BIVALVES, those mollusks whose coverings consist of two concave shelly plates or valves united by a hinge. A vast majority of recent bivalve shells belong to Cuvier's *testaceous* order of *ascephalous* mollusca, the *lamellibranchiate* mollusca of Owen, although with them are some classed as multivalves, on account of accessory valves which they possess. There are also mollusks of the class *brachiopoda* or *palliobranchiata*, which possess bivalve shells, as the *terebratulæ*, or lamp shells, etc. A very large proportion of the bivalve shells of the older fossiliferous rocks belong to the *brachiopoda*.

BIVOUAC, an encampment of soldiers in the open air without tents, each remaining dressed and with his weapons at hand.

BIZERTA, a fortified seaport of Tunis, the most northern town of Africa; at the extremity of a bay formed by Capes Ras-el-Zebib and El-Arid. The town is built on the shore of a lake which communicates with the sea by a canal; and in the time of Barbarossa it was a city of great strength and magnificence. The lake is the chief source of trade, as it abounds in many valuable kinds of fish. Besides the fishery there are valuable coral, grape, olive, and pottery industries. The port is surrounded by walls and defended by two castles. Bizerta steadily declined in commercial and political importance till 1892, when the French Government began converting it into a magnificent naval port. It is now large enough to accommodate at one time all the navies of the world. A canal was also constructed through the Isthmus of Zarzana, connecting the lake with the Mediterranean.

BIZET (bē-zā'), **ALEXANDRE CESAR LEOPOLD** (better known as **GEORGES BIZET**), a French composer, born in Paris, Oct. 25, 1838; studied with Halévy and at the Paris Conservatory. His operas include "Vasco de Gama" (1863); "The Pearl Fishers" (1863); "The Fair Maid of Perth" (1867); "Djamileh" (1872), and "Carmen" (1875), his most famous composition. He also completed Halévy's opera "Noe." He died near Paris, June 3, 1875.

BJELBOG (byel'bog), in Slavonic mythology the pale or white god, as opposed to Tchernibog, the black god, or god of darkness.

BJERREGAARD, HENRIK ANKER (byer'e-gär), a Norwegian dramatic poet, born at Ringsaker, in 1792. His position in his country's literature is very influential, the plays, "Magnus Barefoot's Sons" and "A Mountain Adventure," being national models. A volume of "Poems" (1829) also displays genius. He died in 1842.

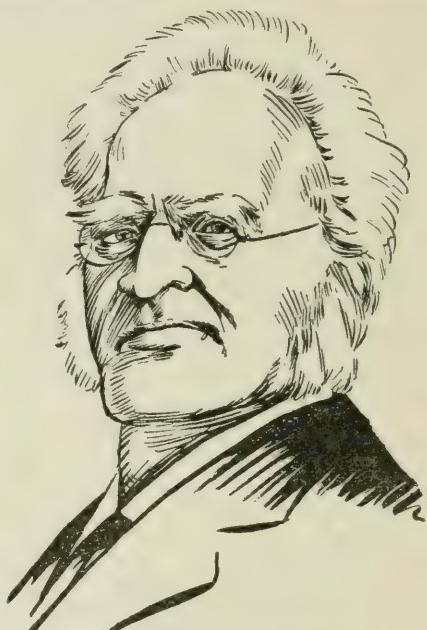
BJÖRN SON, BJÖRNSTJERNE (byern'son), a Norwegian novelist, poet and dramatist, born at Kvikne, Norway, Dec. 8, 1832. He published his first story, "Synnöve Solbakken," in 1857, and that, with "Arne" (1858) and "A Lively Fellow" (1860), established his reputation as a novelist. "Halte Hulda," "Between Battles" (1858); and "Sigurd Slembe" (1862), are among his plays. Of his novels and romances since 1866 the most notable are "The Bridal March," "The Fisher Maiden," and "Captain Mansana." His principal dramatic works are "Mary Stuart" (1864); "Leonarda" (1879); "A Glove" (1889); "Poems and Songs" in 1870. He died April 26, 1910.

BJÖRNSTJERNA, MAGNUS FREDERICK FERDINAND (byern'-stern-ä), **COUNT**, a Swedish statesman, born in 1779. Having entered the Swedish army and risen to be Colonel, he went with the Swedish troops to Germany in 1813 and took part in the battles of Grossbeeren, Dennewitz, the passage of the Elbe, the storming of Dessau, and the battle of Leipsic. He also received the surrender of Lübeck and of Maestricht. After the capitulation of Paris he fought in Holstein and in Norway, at length concluding with Prince Christian Frederick at Moss the convention uniting Norway and Sweden. In 1826 he was made a Count, and in 1828 Plenipotentiary to Great Britain, where he remained till 1846. He published works on "British Rule in the East Indies,"

on the "Theogony, Philosophy, and Cosmogony of the Hindus," etc. He died in 1847.

BLACK, the negation of all color, the opposite of white. There are several black pigments, such as ivory black, made from burned ivory or bones; lamp black, from the smoke of resinous substance; Spanish black, or cork black, from burned cork, etc.

BLACK, ADAM, a Scotch publisher, born in Edinburgh, Feb. 20, 1784. In 1808 he began business as a bookseller,



BJÖRNSTJERNE BJÖRNSON

and later with his nephew, Charles B. Black, established a publishing house in Edinburgh. Their most famous publications were "Encyclopædia Britannica" and the "Waverly Novels." Adam Black was twice Lord Provost of Edinburgh and in 1856-1865 represented that city in Parliament. He declined the honor of knighthood, and a statue was erected in Edinburgh in recognition of his public services, in 1877. He died Jan. 24, 1874.

BLACK, FRANK SWETT, an American lawyer, born in Limington, Me., March 8, 1853; graduated at Dartmouth College in 1875; was editor of the "Journal" in Johnstown, N. Y. He studied law at Troy in the office of Robertson & Foster, and was admitted to the bar in 1879. He won much popularity by his activity in prosecuting the men who

murdered Robert Ross in the election riots in Troy in 1892. In 1895-1897, he was a member of Congress, and in 1897-1899 Governor of New York. At the Republican National Convention in 1904 in Chicago he presented the name of Theodore Roosevelt for President. He died in 1913.

BLACK, JEREMIAH SULLIVAN, an American lawyer, born in Glades, Pa., Jan. 10, 1810; studied law, and was admitted to the bar in 1831. In 1857 he was appointed Attorney-General of the United States by President Buchanan, and in 1860-1861 was United States Secretary of State. On the accession of President Lincoln he retired from public life. He died in York, Pa., Aug. 19, 1883.

BLACK, JOHN, a Scotch editor, born near Duns, Berwickshire, in 1783. He was left an orphan when 12 years old, and educated himself. He went to London in 1810. There he became a Parliamentary reporter for the "Morning Chronicle," of which he was made editor in 1817. Among the contributors to his paper were Charles Dickens and James Mill. In 1843 he retired from the editorship. He was author of a "Life of Tasso, with an Historical and Critical Account of His Writings," and also translated works from the German, French, and Italian. He died in Snodland, June 15, 1855.

BLACK, WILLIAM, a Scottish novelist, born in Glasgow in November, 1841. He received his education at private schools. In 1874 he abandoned journalism. His novels include "Love or Marriage" (1867); "In Silk Attire" (1869); "A Daughter of Heth" (1871); "A Princess of Thule" (1873); "Three Feathers" (1875); "Madcap Violet" (1876); "Macleod of Dare" (1878); "White Wings: a Yachting Romance" (1880); "Yolande" (1883); "Judith Shakespeare" (1884); "White Heather" (1885); "The Strange Adventures of a House-Boat" (1888); "Wolfenberg" (1892); "Briseis" (1896); "Wild Eelin" (1898); besides others. He has also written a "Life of Goldsmith" (1879). He died in Brighton, England, Dec. 10, 1898.

BLACK, WILLIAM MURRAY, an American military engineer, born in Lancaster, Pa., in 1855. He was a graduate of Franklin and Marshall College and the West Point Military Academy. His professional life was spent chiefly in Government river and harbor work. He saw service in Havana and the Philip-

pines. In 1913, he was made chief of the Engineer Corps, succeeding Brigadier-General, William H. Bixby.

BLACK ART, exorcism, the alleged ability to expel evil spirits from haunted houses or from persons bewitched; necromancy, or anything similar. The reason why it was called black was that proficients in it were supposed to be in league with the powers of darkness.

BLACK ASH, a mixture of 25 per cent. of caustic soda with calcium sulphide, quicklime, and unburnt coal, obtained in the process of making sodium carbonate. The mixture of sodium sulphate, chalk, and powdered coal is fused in a furnace, gases escape, and the residue is the black ash.

BLACK ASSIZE, in English history, an assize held at Oxford in 1557, when the High Sheriff and 300 other persons died of infectious disease caught from the prisoners. It was called also the fatal assize.

BLACK BAND, a valuable kind of clay iron-stone occurring in beds in the coal measures, and containing 10 or 15 or even 30 per cent. of coaly matter. Most of the Scotch iron is obtained from it.

BLACK BEETLE, a popular name for the cockroach.

BLACKBERRY (*rubus fruticosus*), a plant common in the northern portions of the United States and in most parts of Europe, and also in northern central Asia, having prickly stems, which somewhat resemble those of the raspberry. The flowers do not appear till the summer is considerably advanced, and the fruit ripens toward the end of it. Jelly and jam are made from the berries, and a very delicate wine. The blackberry is rarely cultivated, perhaps because it is in most districts so abundant in a wild state. One or two varieties, such as the Lawton, show the possibilities.

BLACKBIRD, a well-known British bird, the *turdus merula*. Other English names sometimes given to it are the ring ouzel, the merle, the garden ouzel, or simply the ouzel. A book name is also the black thrush. The male is black, with the bill yellow; the female is deep brown above, lighter beneath, the throat and foreneck pale brown with darker streaks; the young, dusky brown above with dull yellowish streaks, while beneath they have dusky spots. There are several varieties, one of them white. The blackbird is a permanent resident in England. It feeds in winter on snails, and also on

earthworms and berries. It pairs in February or March. Its nest is bulky, and is composed externally of stalks of grasses, twigs, etc. It lays four (generally five) eggs. They are pale bluish green with darker markings. There is no bird in the United States precisely similar to the European bird here described. There are two American species; the red winged blackbird (*argelaius phoeniceus*) and the crow blackbird (*quisculus versicolor*).

BLACKBOY, a name for the grass trees (*xanthorrhœa*) of Australia yielding a gum or resin called blackboy resin or akaroid resin.

BLACKBURN, a town and parliamentary borough of England, 21 miles N. N. W. from Manchester. It has a free grammar school, founded by Queen Elizabeth in 1557, a free school for girls, founded in 1765, and many other public schools; and a free library, a public park of 50 acres, etc. Blackburn is one of the chief seats of the cotton manufacture, there being upward of 110 mills as well as works for making cotton machinery and steam engines. Pop. (1917) 113,315.

BLACKCAP (*sylvia atricapilla*), a European passerine bird of the warbler family, six inches long, upper part of the head black, upper parts of the body gray with a greenish tinge, under parts more or less silvery white. The female has its hood of a dull rust color. The blackcap is met with in England from April to September. Its nest is built near the ground; the eggs, from five to six, are reddish-brown, mottled with a deeper color. It ranks next to the nightingale for sweetness of song. The American blackcap is a species of titmouse (*parus atricapillus*), so called from the coloring of the head.

BLACKCOCK, a name for the male of the black grouse or black game, called also the heathcock (*tetrao tetrix*). The female is called the gray hen, and the young are poult. The blackcock, as its name imports, is black, having, however, white on the wing coverts and under the tail, the two forks of which are directed outward. It is about as large as a domestic fowl. It is found in some abundance in Scotland and less plentifully in England. The eggs are from 6 to 10 in number, of a yellowish gray color, blotched with reddish brown.

BLACK DEATH, THE, one of the most memorable of the epidemics of the Middle Ages, was a great pestilence in the 14th century; which devastated Asia, Europe,

and Africa. It was an Oriental plague, marked by inflammatory boils and tumors of the glands. On account of these boils, and from the black spots which appeared upon the skin, it has been generally called the black death. In England the plague first broke out in the county of Dorset, whence it advanced through the counties of Devon and Somerset to Bristol, and thence reached Gloucester, Oxford, and London. From England the contagion was carried by a ship to Norway, where the plague broke out in its most frightful form.

The whole period of time during which the black death raged with destructive violence in Europe was (with the exception of Russia, where it did not break out until 1351) from 1347 to 1350. Ireland was much less heavily visited than England, and Scotland, too, would perhaps have remained free from it had not the Scotch availed themselves of the discomfiture of the English to make an irruption into England, which terminated in the destruction of their army and the extension of the pestilence through those who escaped over the whole country. It may be assumed that Europe lost by the black death some 25,000,000 of people. See BUBONIC PLAGUE.

BLACK DRAUGHT, sulphate of magnesia and infusion of senna, with aromatics to make it palatable.

BLACK EARTH (*tchernozem* of Russian geologists), the name to a deposit which covers vast areas in south Russia, extending over the steppes and low-lying plateaus that border on the Black Sea, and the depressed area to the N. of the Caspian, with a breadth from N. to S. of from 200 or 300 to nearly 700 miles. It closely resembles the loess of central Europe in texture and structure, for it is fine-grained, and is usually devoid of stratification. It varies in color, however, from dark brown to black, and in thickness from a foot or two up to 6 or 7 yards, occasionally reaching, it is said, even to 60 feet. It is composed chiefly of siliceous sand (about 70 per cent.), alumina and other ingredients (23 per cent.), and organic matter (about 7 per cent.). It bears the same relation to the glacial accumulations of Russia that the loess of the Rhine, the Danube, etc., does to those of central Europe, and is probably the fine-grained silt derived from the torrents and flooded rivers of the glacial period.

BLACKFISH (*tautōga americāna*), a fish caught on the coast of the United States, especially in the vicinity of Long Island. Its back and sides are of a

bluish or crow black; the under parts, especially in the males, are white. Another fish, the *centrolophus morio*, found in the Mediterranean and on the coasts of western Europe, is also called blackfish. It belongs to the mackerel family. In Scotland the term is applied to foul or newly spawned fish. In the United States two species of small whale of the genus *globiocephalus* also have this name.

BLACK FOREST, a great forest, part of the *hercynia silva* of the Roman period. It is situated in Baden and Württemberg, near the source of the Danube.

BLACK FRIARS, friars of the Dominican Order: so called from their costume.

BLACK FRIDAY, the Friday, Sept. 24, 1869, when the attempt of Jay Gould and James Fisk, Jr., to create a corner in the gold market by buying all the gold in the banks of New York City, amounting to \$15,000,000, culminated. For several days the value of gold had risen steadily, and the speculators aimed to carry it from 144 to 200. Friday the whole city was in a ferment, the banks were rapidly selling; gold was at 162½, and still rising. Men became insane, and everywhere the wildest excitement raged, for it seemed probable that the business houses must be closed, from ignorance of the prices to be charged for their goods. But in the midst of the panic it was reported that Secretary Boutwell of the United States Treasury had thrown \$4,000,000 on the market, and at once gold fell; the excitement ceased, leaving Gould and Fisk the winners of \$11,000,000. The term was first used in England, being applied in the first instance to the Friday on which the news reached London, Dec. 6, 1745, that the young Pretender, Charles Edward, had arrived at Derby, creating a terrible panic; and finally to May 11, 1866, when the failure of Overend, Gurney & Co., London, the day before, was followed by a widespread financial ruin.

BLACK GUM (*nyssa multiflora*, order *cornaceæ*), an American tree, yielding a close-grained, useful wood; fruit a drupe of blue black color, whence it seems to get its name of black: it has no gum about it. It is called also pepperidge, and has been introduced into Europe as an ornamental tree.

BLACK HAWK, a famous chief of the Sac and Fox Indians, born in 1767. He joined the British in 1812, and opposing the removal W. of his tribe, fought against the United States in 1831-1832.

He died in 1838. There are "Lives" by Patterson and Snelling.

BLACK HOLE OF CALCUTTA, a small chamber, 20 feet square, in the old fort of Calcutta, in which, after their capture by Surajah Dowlah, the whole garrison of 146 men were confined during the night of June 21, 1756. Only 23 survived. The spot is now marked by a monument.

BLACKIE, JOHN STUART, a Scottish author, born in Glasgow in July, 1809; received his education in Edinburgh, Göttingen, Berlin, and Rome; was Professor of Greek in Edinburgh University from 1852 till 1882, and continued to write and lecture till his death. He advocated preserving the Gaelic language, and founded a Celtic chair in Edinburgh University. His books include translations from the Greek and German; "Lays of the Highlands and Islands" (1872); "Self-Culture" (1874); "Language and Literature of the Scottish Highlands" (1875); "Altavona" (1882); "Wisdom of Goethe" (1883); "Life of Burns" (1888); and "Essays on Subjects of Moral and Social Interest" (1890). He died in Edinburgh, March 2, 1895.

BLACK LEAD, GRAPHITE, or PLUMBAGO, a mineral consisting chiefly of carbon, but containing also more or less of alumina, silica, lime, iron, etc., to the extent of 1 to 47 per cent., apparently mixed rather than chemically combined. Black lead is the popular name, and that by which it is generally known in the arts, though no lead enters into the composition of the mineral; graphite is that generally preferred by mineralogists. It sometimes occurs crystallized in flat hexagonal tables; but generally massive, and more or less radiated, foliated, scaly, or compact. It is of a grayish black color, with a somewhat metallic luster, and a black and shining streak, and is perfectly opaque. It is greasy to the touch, and is a perfect conductor of electricity. It occurs in beds and masses, laminæ or scales in the schistose rocks (gneiss, mica schist, clay slate, etc.), and is sometimes in such abundance as to give its name to the schist (graphite schist) in which it appears. Thick, vein-like masses of black lead are met with in Siberia, Spain, Canada, New Brunswick, United States, Ceylon, and elsewhere. It is far more incombustible than even anthracite (or blind coal), on which account it is much used for the manufacture of crucibles or melting-pots. These are half clay, and black lead. Black lead is employed

for making pencils. It is also extensively employed to give a black gloss to iron grates, railings, etc., and to diminish the friction of belts, machinery, and rifle cartridges.

BLACKLEG, a swindler, especially in cards and races. So called from game-cocks, whose legs are always black.

BLACK LETTER, the Gothic or German type. So called because of its black appearance.

BLACK LETTER DAY, an unlucky day; one to be recalled with regret. The Romans marked their unlucky days with a piece of black charcoal, and their lucky ones with white chalk.

BLACKMAIL, a certain rate of money, corn, cattle or the like, anciently paid, in the N. of England and in Scotland, to certain men who were allied to robbers, to be protected by them from pillage. In the United States, the word is applied to money extorted from persons under threat of exposure in print for an alleged offense; hush-money.

BLACKMAR, FRANK WILSON, an American author and educator, born in West Springfield, Pa., in 1854. He studied at the University of the Pacific and later at Johns Hopkins University. In 1889 he became professor of history and sociology at the University of Kansas, and took an active part in the university extension movement. He was made professor of sociology and economics at the University of Kansas in 1899. Among his publications are "Spanish Colonization" (1890); "History of Higher Education in Kansas" (1900); "Elements of Sociology" (1905); "Economics for High Schools" (1907); and "Play-grounds and Parks" (1910). He was editor of the *Cyclopedia History of Kansas*.

BLACK MARIA, a popular name in the United States applied to the covered wagon, generally painted black, used for the conveyance of prisoners; properly, a prison van.

BLACK MONDAY. (1) A name for Easter Monday, in remembrance of the dreadful experiences of the army of Edward III., before Paris, on Easter Monday, April 14, 1360. Many soldiers and horses perished from the extreme cold. (2) The 27th of Feb., 1865, a memorable day in Melbourne, Australia, when the country round was swept by a destructive sirocco.

BLACKMORE, RICHARD DODD-RIDGE, an English novelist, born in

Longworth, Berkshire, June 9, 1825. He graduated from Oxford in 1847, was called to the bar in 1852, but devoted himself to literature. Among his novels are "Lorna Doone" (London, 1869), by far the most celebrated. "Clara Vaughan" (1864); "The Maid of Sker" (1872); "Cripps, the Carrier" (1876); "Erema" (1877); "Mary Anerley" (1880); "Cris-towell" (1882); "Springhaven" (1887); "Kit and Kitty" (1889); "Perlycross" (1894); "Slain by the Doones" (1895); and "Dariel" (1897). He also published a version of Vergil's "Georgics." He died in London, Jan. 21, 1900.

BLACK MOUNTAINS, the group which contains the highest summits of the Appalachian system, Mt. Mitchell being 6,710 feet, Guyot's Peak, 6,661.

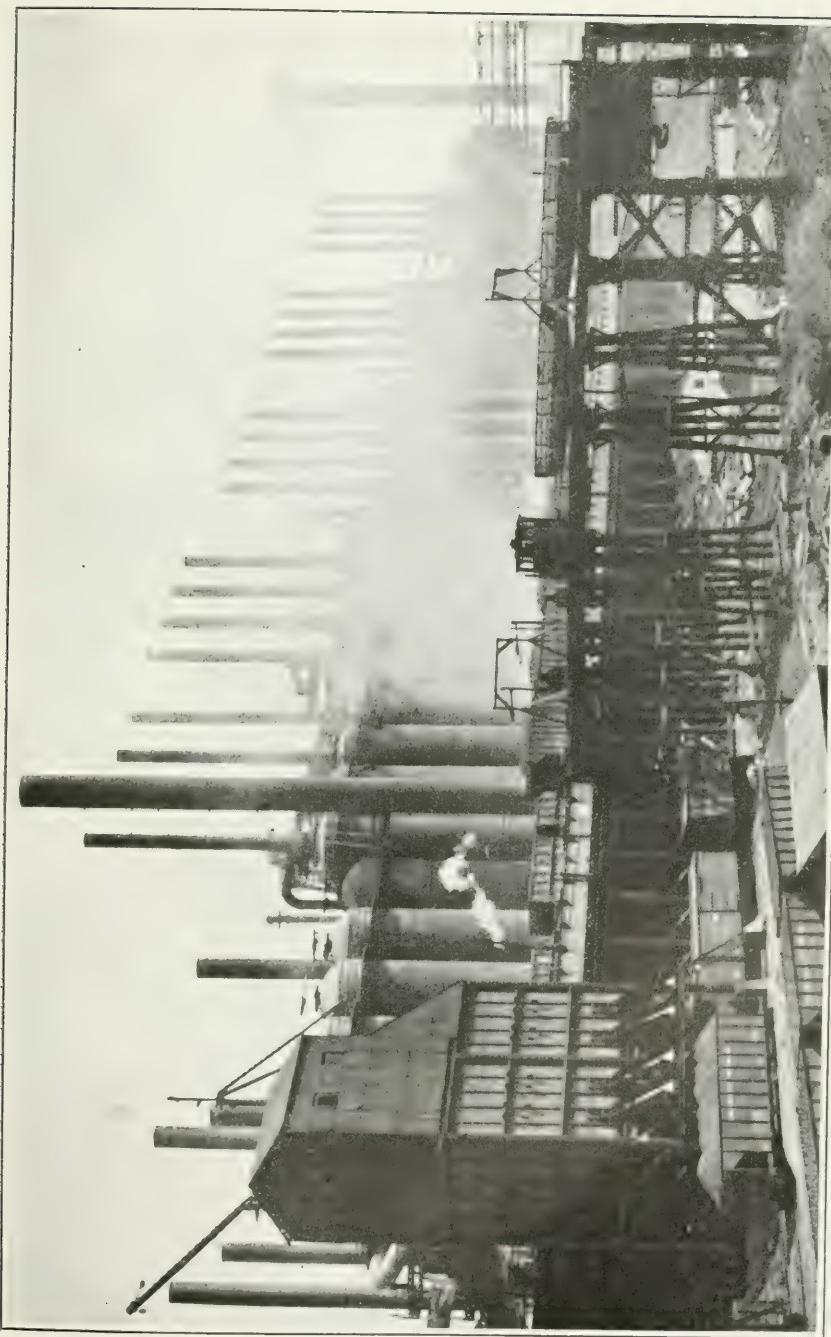
BLACKPOOL, a much frequented watering place of England, on the coast of Lancashire, between the estuaries of the Ribble and Wyre. It consists of lofty houses ranging along the shore for about 3 miles, with an excellent promenade and carriage drive, handsome promenade piers, a large aquarium, fine winter gardens, etc. Pop. (1917) 62,287.

BLACK PRINCE, the son of Edward III. See EDWARD.

BLACK QUARTER, a kind of apoplectic disease which attacks cattle, indicated by lameness of the fore foot, one of the limbs swelling, and after death being suffused with black blood, which also is found throughout the body.

BLACK RIVER, the name of several rivers in the United States: (1) An affluent of the Arkansas river, in Arkansas, 400 miles long. It is navigable to Poplar Bluff, 311 miles; (2) a river in New York, rising in the Adirondacks, and emptying into Lake Ontario near Watertown, length, 200 miles; (3) a river in Wisconsin, flowing S. W., and emptying into the Mississippi river near La-crosse; length, 200 miles; (4) a river rising in the S. E. of Missouri, flowing nearly S., and entering the White river, of which it is the chief tributary, at Jacksonport, Ark.; length, 350 miles, of which 100 miles are navigable.

BLACK SEA (ancient Pontus Euxinus), a sea situated between Europe and Asia, and mainly bounded by the Russian and Turkish dominions, being connected with the Mediterranean by the Bosphorus, Sea of Marmora, and Dardanelles, and by the Strait of Kertsch with the Sea of Azov, which is, in fact, only a bay of the Black Sea; area of the Black Sea and the Sea of Azov about 175,000 square



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STEEL MILL NEAR BIRMINGHAM, ALA.

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THE STAR BETELGEUSE COMPARED IN SIZE WITH OUR OWN SOLAR SYSTEM.
IN THE DRAWING THE SIZES OF SUN AND PLANETS IN PROPORTION TO
BETELGEUSE ARE GREATLY EXAGGERATED, BUT THE APPROXIMATE PROPOR-
TIONS OF PLANETARY ORBITS ARE REPRESENTED. BETELGEUSE WOULD FILL
THE SOLAR SYSTEM ALMOST TO MARS



LOCATION OF BETELGEUSE, IN ORION

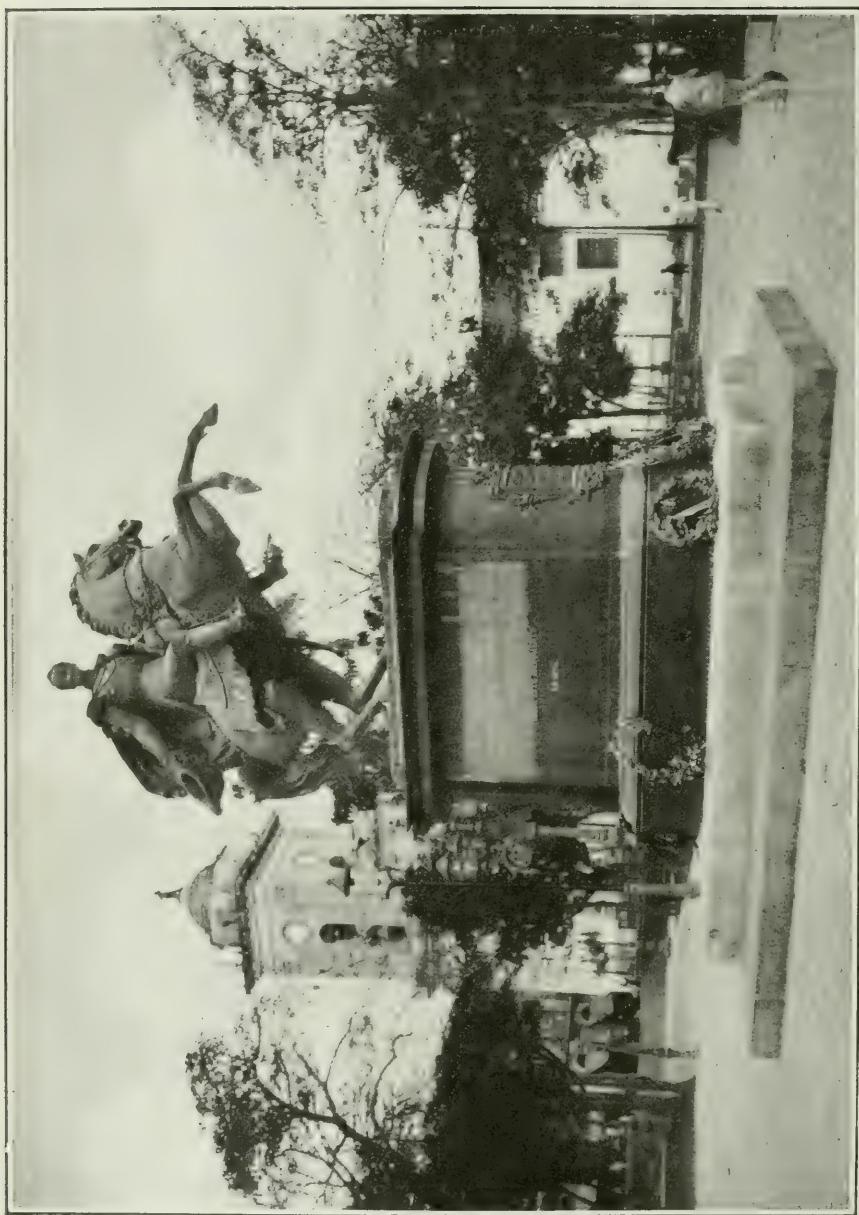
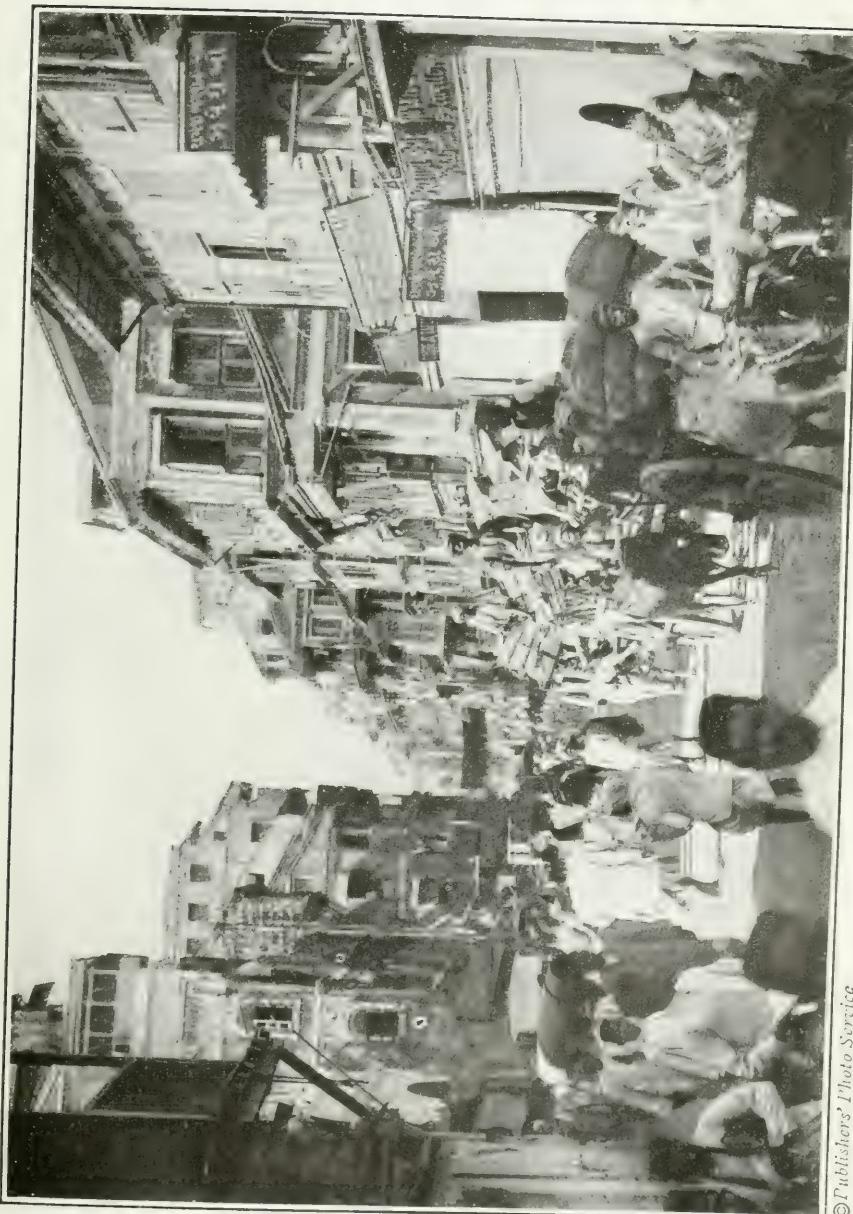


Photo by J. H. Haro

STATUE OF THE "LIBERATOR" SIMON BOLIVAR



© Publishers' Photo Service

A STREET IN THE NATIVE SECTION OF BOMBAY, INDIA



© Press Illustrating Service

TYPES OF GERMAN BOMBS AND GRENADES TAKEN IN THE WORLD WAR

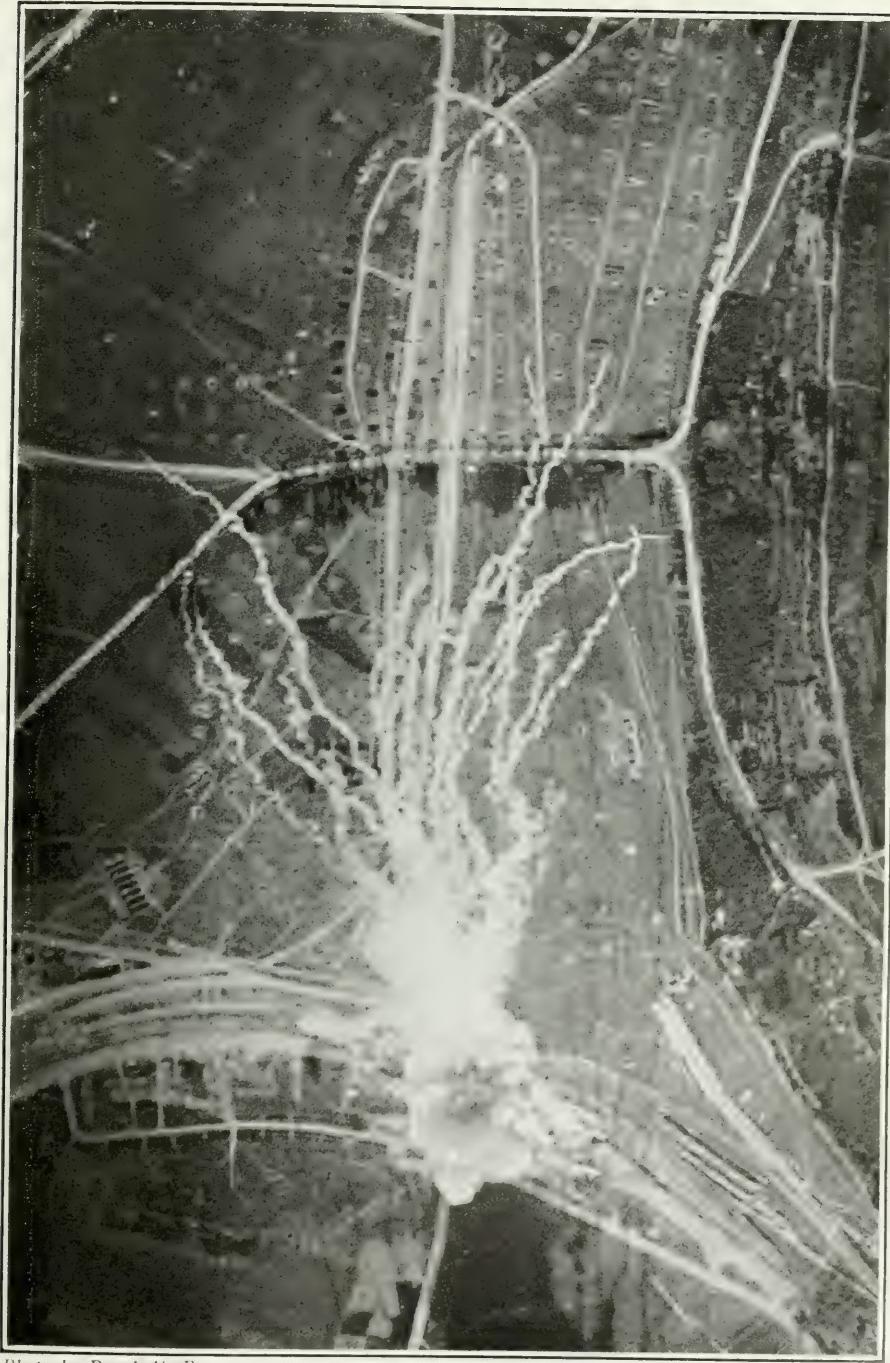
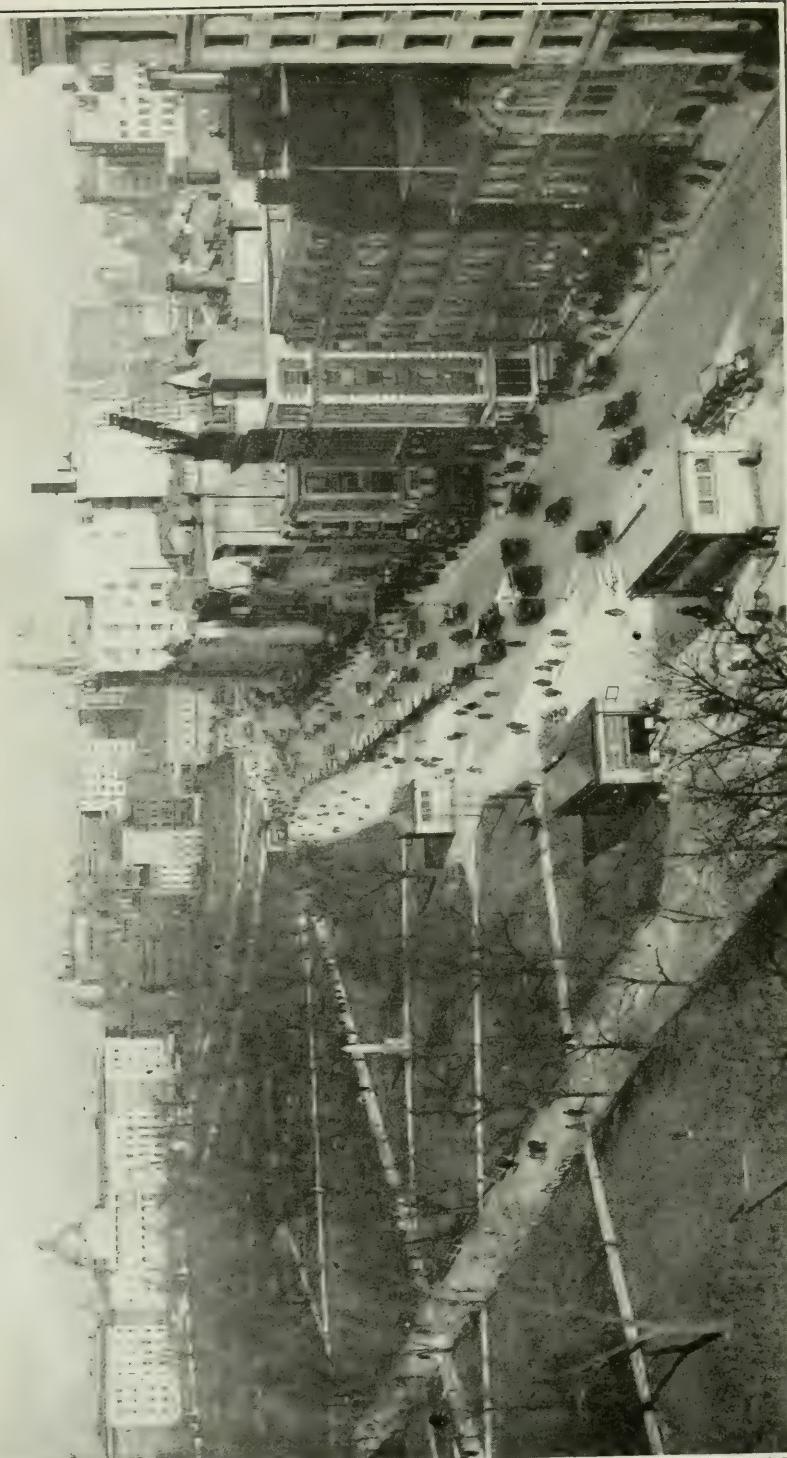


Photo by Royal Air Force

A DIRECT HIT OF AN AVIATOR'S BOMB ON AN AMMUNITION TRAIN
NEAR BRAY, FRANCE

A VIEW OF TREMONT STREET, BOSTON COMMON, AND THE STATE HOUSE, BOSTON, MASS.

© Ewing Galloway



miles: many large rivers fall into it—the Danube, Dniester, Dnieper, Don, etc. In the winter it is scarcely navigable. During January and February the shores from Odessa to the Crimea are ice bound. The most important ports are those of Odessa, Kherson, Eupatoria, Sebastopol, Batum, Trebizond, Samsun, Sinope, and Varna. The fisheries are of some value. After the capture of Constantinople the Turks excluded all but their own ships from the Black Sea until 1774, when, by the Treaty of Kainarji, they ceded to Russia the right also to trade in it. The same right was accorded to Austria in 1784, and by the Peace of Amiens to Great Britain and France in 1802. The preponderance thereafter gained by Russia was one of the causes of the Crimean War, in which she was compelled to cede her right to keep armed vessels in it, the sea being declared neutral by the Treaty of Paris, 1856. In 1871, however, when France could not attend, owing to the Franco-Prussian War, the sea was deneutralized by a conference of the European Powers at London in response to the Russian protest. For military and naval operations in 1914-1918 see WORLD WAR.

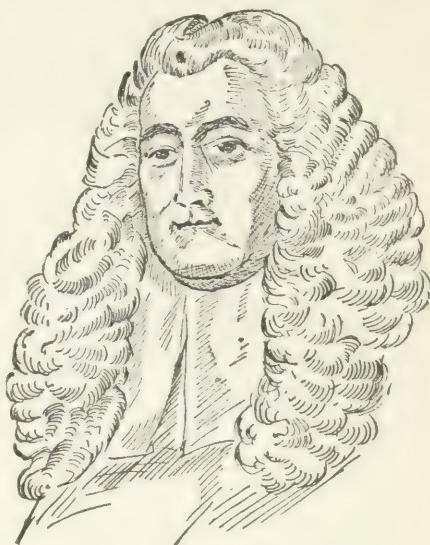
BLACK SHEEP, (*Kârâ-Koin-loo*), a tribe of Turkomans, so called from their standard. This tribe was extirpated by the White Sheep.

A black sheep: a disgrace to the family; a *mauvais sujet*; a workman who will not join in a strike.

BLACK SNAKE (*cobíer constrictor*), a common snake in North America, reaching a length of 5 or 6 feet, and so swift as to have been named the racer, with no poison fangs. It feeds on small quadrupeds, birds, etc., and is useful in killing rats.

BLACKSTONE, SIR WILLIAM, an English jurist, born in London, July 10, 1723; educated at the Charter House and Pembroke College, Oxford. In 1743 he was elected fellow of All-Souls College, Oxford, and in 1746 was called to the bar; but, having attended the Westminster law courts for seven years without success, he retired to Oxford. Here he gave lectures on law, which suggested to Mr. Viner the idea of founding a professorship at Oxford for the study of the common law; and Blackstone was, in 1758, chosen the first Vinerian Professor. In 1759 he published a new edition of the "Great Charter and Charter of the Forest"; and, during the same year, resumed his attendance at Westminster Hall with abundant success. In 1761 he was elected M. P. for Hindon,

made King's Counsel and Solicitor-General to the Queen. He was also appointed Principal of New Inn Hall; which office, with the Vinerian Professorship, he soon resigned. In 1765 he published the first volume of his famous "Com-



SIR WILLIAM BLACKSTONE

mentaries on the Laws of England." It was long the principal text-book of English law. He died Feb. 14, 1780.

BLACK TIN, tin ore when dressed, stamped, and washed ready for smelting, forming a black powder.

BLACK WALNUT, a valuable timber tree (*juglans nigra*) of the United States and its fruit. The great size often reached by this tree, the richness of the dark brown wood, the unique beauty of the grain sometimes found in burls, knots, feathers and in the curl of the roots, all conspire to make this the most choice and high priced of all our native woods.

About 1870 walnut was extensively used in the manufacture of fine furniture and finishings in the United States. Then quartered-oak grew in favor, but since 1900 walnut has again become a favorite. Though found to some extent in the Atlantic States from Massachusetts southward, the great source of supply has been the central portions of the Mississippi valley. The walnut is at home in the rich alluvial bottom lands of the Western streams and in the stony limestone soils of the hills and mountains.

BLACK WARRIOR, a river of Alabama, formed by the confluence of the

Locust and Mulberry forks; flows into the Tombigbee near Demopolis; navigable in its lower course to Tuscaloosa; 300 miles long.

BLACKWELL, a city of Oklahoma, in Kay co. It is on the Atchison, Topeka and Santa Fe, and the Frisco Line railroads, and the Shicaska river. There are parks, and several handsome public buildings. The town is the seat of the Oklahoma State College. The industries include clay, brick, glass works, and flour mills. Pop. (1910) 3,266; (1920) 7,174.

BLACKWELL, MRS. ANTOINETTE LOUISA (BROWN), an American woman suffragist and Unitarian minister, born at Henrietta, N. Y., May 20, 1825. A graduate of Oberlin (1847), she "preached on her own orders," at first in Congregational churches, becoming at length a champion of women's rights. She married Samuel C., a brother of Dr. Elizabeth Blackwell (1856). She has written "Shadows of Our Social System" (1855); "The Island Neighbors" (1871), a novel of American Life; "Sexes Throughout Nature" (1875); "Sea Drift" (1903); "The Making of the Universe" (1914); "The Social Side of Mind and Action" (1915).

BLACKWELL, ELIZABETH, an American physician and medical and ethical writer, born at Bristol, England, 1821. She is the first woman who ever obtained the degree of M. D. in the United States (1849), beginning practice in New York (1851). With her sister, Emily, she opened the New York Infirmary for Women and Children (1854), organizing in connection with it the Women's Medical College (1867). In 1868 she became professor in a woman's medical college that she had assisted in organizing in London. She has written "Laws of Life" (1852); "Counsel to Parents on the Moral Education of Their Children" (1879); "Pioneer Work in Opening the Medical Profession to Women," etc. She died in London, 1910.

BLACKWELL, LUCY STONE, an American woman suffragist, born in West Brookfield, Mass., Aug. 13, 1818; was graduated at Oberlin College in 1847; became a lecturer on woman suffrage, and a contributor to the press. In 1855 she married Henry B. Blackwell, a merchant of Cincinnati. She died in Dorchester, Mass., Oct. 20, 1893.

BLACKWELL'S ISLAND an island belonging to the city of New York, in the East river, containing about 120 acres. On it are the penitentiary, almshouse, lunatic asylum for females, work-

house, blind asylum, hospital for incurables, and a convalescent hospital. Nearly all of these buildings were erected from granite quarried on the island, and by convict labor. The island is bordered by a heavy granite sea wall, also built by the convicts.

BLACKWOOD, or INDIAN ROSEWOOD, a leguminous tree of Hindustan (*dalbergia latifolia*), the timber of which is highly valued and much used in the manufacture of fine furniture. The Australian blackwood is the *acacia melanoxylon*.

BLACKWOOD, WILLIAM, a Scotch publisher, born at Edinburgh, Nov. 20, 1776. He started as a bookseller in 1804, and soon became also a publisher. The first number of "Blackwood's Magazine" appeared April 1, 1817, and it has always been conducted in the Tory interest. He secured as contributors most of the leading Tory writers, among them Sir Walter Scott, Lockhart, Hogg, Professor Wilson, De Quincey, Dr. Moir (Delta), Dr. Mangan, John Galt, and others. The work of editor he performed himself. After his death the business, which had developed into a large publishing concern, was carried on by his sons, and the magazine still keeps its place among the leading periodicals. He died Sept. 16, 1834.

BLADDER, a membranous bag in man and the higher animals, designed for the reception of the urine, as it is secreted by the kidneys. This, being the most important structure of the kind in the frame, is called, by way of prominence, the bladder; any other one is distinguished from it by a word prefixed, as the gall bladder.

BLADDER WORT, the English name of *utricularia*, a genus of scrophulariaceous plants. Both the English and the scientific appellations refer to the fact that the leaves bear at their margins small bladders.

BLAIKIE, WILLIAM GARDEN, a Scotch clergyman, born in Aberdeen, in 1837; was graduated at the University of Aberdeen; ordained a minister of the Established Church in 1842; joined the Free Church in 1843; and was appointed Professor of Apologetics and Pastoral Theology in New College, Edinburgh, in 1868. He was a delegate to the Presbyterian General Assembly of the United States in 1870; took a leading part in the formation of the Alliance of the Reformed Churches; and was editor of the "Free Church Magazine" in 1849-1853, the "North British Review" in 1860-1863, the "Sunday Magazine" in 1871-1874, and

the "Catholic Presbyterian" in 1879-1883. His writings include "Bible History in Connection with General History" (1859); "Bible Geography" (1860); "Glimpses of the Inner Life of David Livingstone" (1880); "Leaders in Modern Philanthropy" (1884); etc. He died in North Berwick, Scotland, June 11, 1899.

BLAINE, JAMES GILLESPIE, an American statesman, born in West Brownsville, Pa., Jan. 31, 1830. He graduated at Washington College, Pa., in 1847. In 1854 he removed to Augusta, Me., and engaged in journalism. He was one of the founders of the Republican



JAMES G. BLAINE

party, and in 1856 was a delegate to the first Republican National Convention, which nominated Frémont for the Presidency. In 1858 he was elected to the Legislature of Maine, and in 1862 to the House of Representatives of the National Congress. He became Speaker of the House in 1864, and held that office for six years; was a member of the Senate from 1876 to 1881; was twice Secretary of State (1881-1882 and 1889-1892). He was defeated for the Presidency in 1884 by Grover Cleveland. Besides his numerous speeches and writings on the public questions of his day, his best known work is his "Twenty Years in Congress" (2 vols., 1884-1886), a historical production of great and permanent value. He died in Washington, D. C., Jan. 27, 1893.

BLAINVILLE, HENRI MARIE DUCROTAY DE (*blan-vé'l'*), a French naturalist, born in 1777. After attending a military school, and also studying art, his interest in Cuvier's lectures led him to the study of medicine and natural history. Cuvier chose him for his assistant in the College of France and the Museum of Natural History, and in 1812 secured for him the chair of Anatomy and Zoology in the Faculty of Sciences at Paris. In 1825 he was admitted to the Academy of Sciences; in 1829 he became professor in the Museum of Natural History, lecturing on the mollusca, zoophytes, and worms; and in 1832 he succeeded Cuvier in the chair of Comparative Anatomy there. His chief works are "Animal Organism, or Principles of Comparative Anatomy," "Manual of Mollusks and Shell Fish," "Manual of Actinology" and "Osteology," a work on the vertebrate skeleton. He died in 1850.

BLAIR, HENRY WILLIAM, an American legislator, born in Campton, N. H., Dec. 6, 1834; received an academic education; was admitted to the bar in 1859; served through the Civil War, becoming Lieutenant-Colonel of the 15th New Hampshire Volunteers, and being twice wounded. After serving in both branches of the State Legislature he was a member of Congress in 1875-1879 and 1893-1895, and a United States Senator in 1879-1889. He is the author of what was known as the "Blair Common School Bill," designed to distribute a certain amount of Federal money for educational purposes among the various States in proportion to the number of illiterates. He was a strong opponent of Chinese immigration, and, when he was appointed and confirmed United States Minister to China, that government objected to receiving him. He was an earnest advocate of temperance reform, and wrote much in its behalf.

BLAIR, JOHN INSLEY, an American philanthropist, born in Belvidere, N. J., Aug. 22, 1802; was in early life a merchant and banker; subsequently becoming the individual owner of more miles of railroad property than any other man in the world. He acquired a very large fortune; loaned the Federal Government more than \$1,000,000 in the early part of the Civil War; built and endowed, at a cost of more than \$600,000, the Presbyterian Academy in Blairstown, N. J.; rebuilt Grinnell College, Iowa; erected Blair Hall and made other gifts to Princeton University; was equally liberal to Lafayette College; and had erected more than 100 churches in differ-

ent parts of the West, besides laying out many towns and villages on the lines of his numerous railroads. He died in Blairstown, N. J., Dec. 2, 1899.

BLAIR, MONTGOMERY, an American lawyer, born in Franklin co., Ky., May 10, 1813; was graduated at the United States Military Academy in 1835; resigned from the army in 1836; admitted to the bar in 1839; began practice in St. Louis. He was Judge of the Court of Common Pleas in 1843-1849; removed to Maryland in 1852; was United States Solicitor in the Court of Claims in 1855-1858. He acted as counsel for the plaintiff in the widely known Dred Scott case. In 1861-1864 he was Postmaster-General. In 1876-1877 he acted with the Democratic party in opposing Mr. Hayes' title to the office of President. He died in Silver Springs, Md., July 27, 1883.

BLAKE, EDWARD, an English statesman, born in Adelaide, Ont., Canada, Oct. 13, 1833; was educated at Upper Canada College and Toronto University; called to the bar in 1856; and engaged in practice in Toronto. He entered public life in 1867; was Premier of Ontario in 1871-1872, Minister of Justice in 1875-1877, and the recognized leader of the Canadian Liberal party in 1880-1891. He declined the appointments of Chancellor of Upper Canada in 1869, Chief Justice of Canada in 1875, and Chief Justice of Ontario in 1897, and also the honor of knighthood. In 1892 he was invited by the leaders of the Anti-Parnellites in Ireland to enter the British House of Commons as the representative of an Irish constituency. Consenting, he removed to South Longford, was elected for that district, and in 1895 was re-elected. In 1896 he was appointed a member of the Judiciary Committee of the Privy Council. He died in Toronto, 1912.

BLAKE, ELI WHITNEY, an American inventor, born in Westboro, Mass., Jan. 27, 1795; graduated at Yale University in 1816. He began business with his uncle, Eli Whitney, in the manufacture of fire-arms; and in 1834 founded, near New Haven, Conn., the pioneer factory for the manufacture of domestic hardware. In 1857 he invented the widely known stone and ore crusher called the Blake crusher, which introduced a new era in road making and mining industries, and is used throughout the world. He died in New Haven, Conn., Aug. 17, 1886.

BLAKE, ROBERT, a British naval officer, born at Bridgewater in 1599. He

studied at Oxford and was elected a member for Bridgewater in the Parliament of 1640. This being soon dissolved he lost his election for the next, and sought to advance the Parliamentary cause in a military capacity in the war which then broke out. He soon distinguished himself, and in 1649 was sent to command the fleet with Colonels Deane and Pop-



ROBERT BLAKE

ham. He attempted to block up Prince Rupert in Kinsale, but the Prince escaped to Lisbon, where Blake followed him. Being refused permission to attack him in the Tagus by the King of Portugal, he took several rich prizes from the Portuguese, and followed Rupert to Malaga, where, without asking permission of Spain, he attacked him and nearly destroyed the whole of his fleet. In the Dutch War which broke out in 1652 he was attacked in the Downs by Van Tromp with a fleet of 45 sail, the force of Blake amounting only to 23, but Van Tromp was obliged to retreat. In February following he put to sea with 60 sail, and soon after met the Dutch Admiral, who had 70 sail and 300 merchantmen under convoy. During three days a running fight up the Channel was maintained, resulting in the loss of 11 men-of-war and 30 merchant ships by the Dutch, while that of the English was only one man-of-war. In this action Blake was severely wounded. On June 3 he again engaged Van Tromp and forced the Dutch to retire, with considerable loss, into their own harbors. In November, 1654, he was sent with a strong fleet to enforce a due respect to the British flag in the Mediterranean. He sailed first to

Algiers, which submitted, and then demolished the castles of Goletta and Porto Ferino, at Tunis, because the Dey refused to deliver up the British captives. A squadron of his ships also blocked up Cadiz, and intercepted a Spanish plate fleet. In April, 1657, he sailed with 24 ships to Santa Cruz, in Teneriffe; and, notwithstanding the strength of the place, burned the ships of another Spanish plate fleet and came out without loss. He died Aug. 17, 1657, and was buried in Westminster Abbey, whence his body was removed at the Restoration and buried in St. Margaret's Churchyard.

BLAKE, WILLIAM, an English poet and artist, born in London, Nov. 28, 1757; learned to draw; became a noted illustrator and engraver; had a printshop in



WILLIAM BLAKE

London; and exhibited at the Royal Academy. His imagination was strange, powerful, grotesque, and poetic; and his belief was that his poems and drawings were communications from the spirit world. His "Poetical Sketches" (London, 1783); "Songs of Innocence" (1789), and "Songs of Experience" (1794), contain pastoral and lyrical poems of great beauty. His "Prophetic Books," including "Book of Thel" (1789); "Marriage of Heaven and Hell" (1790); "Book of Urizen" (1794); "Book of Los" (1795); "Book of Ahania" (1795); "Jerusalem" (1804), and "Milton" (1804), are famous. His greatest artistic work is in "Illustrations to the Book of Job" (1826). He died in London, Aug. 12, 1827.

BLAKELOCK, RALPH ALBERT, an American painter, born in New York City, Oct. 15, 1847; was graduated from the College of the City of New York in 1869; was self-educated in art. His paintings include "Ta-vo-kok-i; or, the Circle Dance of the Kavavite Indians," "Cloverdale, Cal., "Moonlight," "The Indian Fisherman," "A Landscape," "On the Face of the Quiet Waters," "Cumule," etc. Examples of his work are exhibited in the Metropolitan Museum of Art, New York, and public galleries in Washington, Worcester, etc. For years his work was unappreciated, so that his mind became affected and he spent some years in an asylum. The National Academy paid him tardy recognition by making him an associate in 1913 and an academician in 1915. He died in 1916.

BLANC, JEAN JOSEPH LOUIS, a French socialist and historian, was born in Madrid, where his father was Inspector-General of Finance under King Joseph, Oct. 29, 1811. After finishing his school education he went to study in Paris. In 1839 he founded the "Revue du Progrès," in which he first brought out his chief work on socialism, the "Organization of Industry." The book denounces the principle of competitive industry and proposes the establishment of social workshops, composed of workmen of good character, and subsidized by the State. In 1841-1844, Blanc published a historical work, entitled "History of Ten Years (1830-1840)," which produced a deadly effect on the Orleans dynasty. This was followed by the first volume of a "History of the French Revolution." On the breaking out of the Revolution of February, 1848, Blanc was appointed a member of the Provisional government, at the head of the great commission for discussing the problem of labor. At the same time, Marie, Minister of Public Works, began to establish the so-called national workshops, which, however, were in no sense an attempt to carry out the views of Blanc. Blanc was accused, without reason, of a share in the disturbances of the summer of 1848, and escaped to London, where he spent many years. On the fall of the empire, Blanc returned to France, and was elected to the National Assembly in 1871. After 1876 he was member of the Chamber of Deputies. In both these bodies he voted and acted with the Extreme Left. He died at Cannes, Dec. 6, 1882.

BLANC, MARIE THÉRÈSE (THÉRÈSE BENTZON), a French novelist and littérateur, born at Seine-Port, Sept. 21, 1840. She has been for many years on the

editorial staff of the "Revue des Deux Mondes," to which she has contributed notable translations and reviews of many American, English, and German authors. Her literary essays on these contemporaneous writers were collected in "Foreign Literature and Customs" (1882) and "Recent American Novelists" (1885). Her first work to attract attention was "A Divorce" (1871). Two other novels, "A Remorse" (1879), and "Tony" (1889), were crowned by the French Academy. Other stories are "Georgette" and "Jacqueline" (1893). The fruit of her first visit to the United States was "Condition of Woman in the United States" (1895); "Au Dessus de l'Abime" (1905). She died in 1907.

BLANC, PAUL JOSEPH, a French genre painter; studied under Bin and Cabanel. He won the Grand Prize of Rome in 1867; the first class medal of the Paris Salon in 1872; the decoration of the Legion of Honor in 1878; and the first class medal in the Paris Exposition of 1889. One of his best known works is a decorative composition depicting events in the life of Clovis. He died July 5, 1904.

BLANCHING, or **ETIOLATION**, a process of culture restored to by gardeners to prevent certain secretions which in ordinary circumstances, take place in the leaves of plants, and to render them more pleasant and wholesome for food. Artificial blanching is managed (1) by earthing up the leaves and succulent stems of plants, such as celery, asparagus, etc. For this purpose celery is planted in trenches, and earth is gradually drawn in round the stems as they advance in growth. (2) By tying together the leaves with strings of matting, as is sometimes done with lettuce, endive, etc. (3) By overlaying, which can be done with tiles, slates, pieces of board, or utensils made for the purpose. The most common is the blanching pot, used to exclude the light from seakale, rhubarb, and some other culinary vegetables, in which the green color is to be avoided.

BLANC-MANGE, in cookery, a name of different preparations of the consistency of a jelly, variously composed of dissolved isinglass, arrow root, maize flour, etc., with milk and flavoring substances.

BLANCO, ANTONIO GUZMÁN, a Venezuelan military officer, born in Caracas, Feb. 29, 1828. He became prominent in the Federalist revolts, 1859-1863, and, when his party triumphed, was made first Vice-President in 1863 under Falcon,

who was deposed in the Revolution of 1868. Blanco led a successful counter revolution in 1870, became President, and retained the office till 1882. In 1893 he was appointed Minister to France, where he resided till his death, July 29, 1899.

BLANCO, CAPE, a remarkable headland on the W. coast of Africa, in $20^{\circ} 47'$ N. lat., and $16^{\circ} 58'$ W. long., the extremity of a rocky ridge which projects from the Sahara in a westerly direction, and then, bending southward, forms a commodious harbor called the Great Bay. Cape Blanco was first discovered by the Portuguese in 1441. Cape Blanco (*i. e.*, White Cape) is also the name of several less important headlands in Spain, Greece, America, and the Philippines.

BLAND, EDITH NESBIT, an English author, writing under the name "E. Nesbit," born in London, Aug. 15, 1858. She has been a prolific writer of books for the young that have met with popular favor, and has also published some volumes of verse. Among her works are "Leaves of Life" (1888); "The Marden Mystery" (1896); "The Story of the Treasure Seekers" (1899); "The Red House" (1903); "Man and Maid" (1906); "Salome and the Head" (1909); and "Wings and the Child" (1913).

BLAND, JOHN OTWAY PERCY, an English journalist and author; born in Whiteabbey, County Antrim, Ireland, Nov. 15, 1863. He studied in Switzerland and at Trinity College, Dublin. He was secretary of Sir Robert Hart, when the latter was in China on his work in connection with the Chinese customs finances (1883-1885), and in 1906 became the representative in China of the British and Chinese Corporation. He was Chinese correspondent of the London "Times" from 1897 to 1910. His knowledge of Chinese life and character was extensive and profound. He lectured widely on the subject both in England and America. Among his works are "Houseboat Days In China" (1909), "China Under the Empress Dowager" (1910), "Annals and Memoirs of the Court of Peking" (1913) and "Li Hung Chang" (1917).

BLAND, RICHARD PARKS, an American legislator, born near Hartford, Ky., Aug. 19, 1835; received an academic education, and, between 1855 and 1865, practiced law in Missouri, California, and Nevada, and was engaged for some time in mining. In 1865 he settled in Rolla, Mo., and practiced there till 1865, when he removed to Lebanon in the same State. He was a member

of Congress in 1873-1895 and from 1897 till his death. In 1896 he was a conspicuous candidate for the Presidential nomination in the Democratic National Convention. Mr. Bland was best known as the leader in the Lower House of Congress of the Free-Silver movement, and the author of the Bland Silver Bill. He died in Lebanon, Mo., June 15, 1899. See BLAND SILVER BILL.

BLAND SILVER BILL, one of the most notable measures of American Congressional history. The original bill, as introduced by Representative Bland and passed by the House late in 1877, provided simply for the free and unlimited coinage of silver by all the mints of the United States. This program represented the full policy of the Silver men. The silver dollar had been demonetized by the act of 1873, and its coinage had been wholly abandoned. The Bimetallists desired to restore it to perfect equality with gold as a standard of value, and the original Bland bill, permitting owners of silver bullion to have their commodity coined into dollars by the mints, was intended as the means to accomplish that object. But the Senate amended the measure materially. The free coinage clause was stricken out, and, as a concession to the Silver men, it was directed that the Secretary of the Treasury should purchase monthly not less than \$2,000,000 and not more than \$4,000,000 worth of silver bullion, at the market price of the metal, and coin it into standard silver dollars, which should be unlimited legal tender for all debts. The amended bill was reported by Senator Allison, Chairman of the Finance Committee, and hence received the name of the Bland-Allison Act. It was vetoed by President Hayes, but passed over his veto, Feb. 28, 1878, by 196 to 73 in the House, and by 46 to 19 in the Senate. The silver purchase clause in this act was repealed by the Sherman Act of 1890.

BLANKENBURG, RUDOLPH, an American business man and politician, born in Lippe-Detmold, Germany, in 1843, where he received his education. He came to the United States in 1865, and embarked on a business career, first as an employee and afterward on his own account in Philadelphia. There he became prominent in civic movements, and in 1905 was elected county commissioner by a large majority. He was chosen mayor two years later and served until 1916. He was an extensive traveler and a frequent contributor to periodicals. He died April 12, 1918.

BLANKET, a coarse, heavy, loosely woven, woolen stuff, usually napped and sometimes twilled, used for covering one when in bed. The word is also applied to anything fitted to intercept vision, the allusion being to the fact that a blanket was formerly used as a curtain in front of the stage.

BLANK VERSE, verse which is void of rhyme; any kind of verse in which there is not rhyme, blanched or omitted. The verse of the Greeks and Romans—at least such of it as has come down to us—is without rhyme. The first attempt at blank verse in English appears to have been a translation of the first and fourth books of the "Æneid" by the Earl of Surrey, who was executed in 1547. Its suitability for the drama was at once felt, and it was in general use in dramatic composition before Shakespeare began to write, which is supposed to have been about 1591. It was, however, almost entirely confined to the drama down to the appearance of "Paradise Lost," by Milton, in 1667. Since Milton's time, blank verse has come into use in various kinds of poetry besides the dramatic; but it is principally in the heroic meter of 10 syllables that blank verse is used, and, indeed, by some the term is restricted to that kind of meter.

BLAPSIDÆ, a family of nocturnal black beetles, whose wings are generally obsolete and their elytra soldered together. They frequent gloomy, damp places, and when seized discharge, in self-defense, a liquid of a peculiar, penetrating odor. *Blaps mortisaga*, or churchyard beetle, is the most familiar British specimen.

BLARNEY, a village in Ireland, 4 miles N. W. of the city of Cork, with Blarney Castle in its vicinity. A stone called the Blarney Stone, near the top of the castle, is said to confer on those who kiss it the peculiar kind of persuasive eloquence alleged to be characteristic of the natives of Ireland.

BLASCO IBÁÑEZ, VICENTE, Spanish novelist; born 1866. He early became active in radical agitation, and suffered several terms of imprisonment for too fiery expression of his political convictions. He has represented Valencia in the Cortes as a Republican deputy. It is as a novelist, however, that he is best known. His novels, "La Catedral," "La Barraca," "El Intruso," have a great vogue in Spain. After the war began he gained a wider audience in the world at large by his "Four Horsemen of the Apocalypse," based on the German inva-

sion of France and Belgium, and "Mare Nostrum," a powerful romance dealing with the Mediterranean. In 1920 he



VICENTE BLASCO IBÁÑEZ

visited the United States and spent some time in Mexico at the time of the Obregon revolution.

BLASHFIELD, EDWIN HOWLAND, an American artist, born in New York City, Dec. 16, 1843; studied in Paris under Léon Bonnat; and began exhibiting in the Paris Salon in 1874. He returned to the United States in 1881, and has since distinguished himself by the execution of large decorative works. Among his noteworthy productions in this line are one of the domes of the Manufacturers' Building in the World's Columbian Exposition, the great Central Dome of the Library of Congress, and the new apartment of the Appellate Court in New York City; besides ceiling and panel work in clubs and residences. He decorated the Baltimore Court House, Iowa State Capitol, Great Hall, University of New York, Wisconsin State Capitol, etc. He lectured on art at Yale, Harvard, and Columbia, and was the author, with Mrs. Blashfield of "Italian Cities." Author "Mural Painting in America" (1913).

BLASPHEMY, slander or even well merited blame, applied to a person or in condemnation of a thing; also the utterance of injurious, highly insulting, calumnious, or slanderous language against a person in high authority, especially against a king. In the United States blasphemy is punishable in all of the older States of the Union, under the acts against profanity and indecent language, disorderly conduct, etc.

The word is particularly applied to any profane language toward God; addressed to, or spoken or written regarding God. In theology, blasphemy against the Holy Ghost means the sin of attributing to Satanic agency the miracles which were obviously from God.

BLAST FURNACE, a structure built of refractory material in which metallic ores are smelted in contact with fuel and flux, the combustion of the fuel being accelerated by air under pressure. The materials are fed in at the top of the furnace, and after the ores are reduced, the metal, or in some cases the matte, and the resulting slag are tapped in a molten state at or near the bottom, as a rule the slags, being of less specific gravity than the metal, float upon it.

A typical vertical section of a blast furnace consists of a cylindrical or rectangular hearth or crucible, into which the air is admitted, under pressure, through tuyeres. On this hearth is superposed an inverted frustum of a cone forming the boshes, and on this inverted cone a right frustum of a cone, forming the shaft, is superposed. The shafts are inclosed by shells of sheet steel or by crinolines formed of bands and beams, and carried on columns. The boshes are usually secured by bands and the crucibles by sheet metal jackets. The materials are charged into the shaft so that layers of fuel alternate with layers of ore and flux, the taper of the shaft being sufficient to permit of expansion as the materials are heated, and facilitate their delivery to the hopper formed by the boshes, where reduction of the ores takes place. The reduced ore, meeting the burning fuel near the tuyeres, is melted, and the liquid slag and metal drop into the hearth or crucible (the cinder or slag floating on the liquid metal), from which they are tapped out from time to time. By heating the blast before it enters the tuyeres combustion is accelerated, and the furnaces produce increased quantities of metal with reduced fuel consumption per unit of product.

As a rule, blast furnaces smelting other ores than those of iron have the top of the furnace stack open, while, in those

producing iron, the top is usually sealed by a bell closing against a hopper, to distribute the stock in the wide throat of the furnace and to control the gases which are the result of the smelting operation, so as to employ the calorific value of these gases for heating the blast or for generating steam in boilers to operate machinery. The practicability of using these gases in engines, where the gas, in exploding, gives impetus to a piston, has also been demonstrated. The blast is heated in hot blast stoves, generally cylinders from 14 to 25 feet in diameter and from 50 to 115 feet high, filled with checker work of fire brick. These stoves are placed in series; the gas being admitted to and burned in a stove raises the temperature of the masonry, when the gas is shut off and the blast forced through the highly heated checkers. By alternating a series of stoves on gas or blast, at intervals of one or two hours, uniform temperature is maintained.

The blast, after passing through the hot blast stoves, is conveyed in iron or steel conduits, lined with fire brick, to tuyeres, set in the walls of the crucible. These tuyeres are formed of an inner and outer shell with closed ends, water circulating between the two shells. The tuyeres are mostly made of bronze or copper and are set in larger tuyere blocks (also water cooled) of iron or bronze. Nozzles connect the lined air conduits to the tuyeres. The cooling water required by a modern blast furnace amounts to millions of gallons daily. A large furnace requires a boiler equipment of from 3,000 to 3,500 horse power for its blowing, pumping and elevating machinery, electric plant, etc.

There were on Jan. 1, 1920, 262 blast furnaces in operation in the United States. See IRON AND STEEL.

BLASTOIDEA (so called from their oval or globular form, like that of a bird), an order of *echinoderms*, called also pentremites. They are found only in Palaeozoic rocks.

BLATCHFORD, SAMUEL, an American jurist, born in New York City, March 9, 1820; was graduated from Columbia College in 1837; became private secretary to William H. Seward, when the latter was elected Governor of New York; practiced law in New York City; became Judge of the District Court for the Southern District of New York in 1867; Circuit Judge of the Second Judicial Circuit in 1878; and Justice of the Supreme Court of the United States in 1882. He died in Newport, R. I., July 7, 1893.

BLATTA, a genus of insects, the typical one of the family *blattidae*. It contains the various species of cockroaches. *B. orientalis* is the common species in houses in the southern portions of the United States, though, as its name implies, it is believed to have come first from the East. In the higher latitudes of the United States *B. orientalis* is rarely or never seen, its place being taken by *B. americana*, or the kakerlac, as it is called.

BLAVATSKY, HELENE PETROVNA, a noted theosophist, born in Yekaterinoslav, Russia, in 1831; founded the Theosophical Society in New York in 1875, and wrote "Isis Unveiled" (1876); "The Secret Doctrine" (1888); "Key to Theosophy" (1889), etc. She died in London, May 8, 1891.

BLAZON, or **BLASION**, a heraldic term which originated in the custom of blowing a trumpet to announce the arrival of a knight, or his entrance into the lists at a joust or tournament. The blast was answered by the heralds, who described aloud and explained the arms borne by the knight.

BLAZONRY, the art of describing a coat of arms in such a way that an accurate drawing may be made from the verbal statements given.

BLEACHING, the art of rendering materials colorless. This is done by exposing them to the actinic rays of the sun, or by the action of bleaching agents. The chief of these is called bleaching powder. It is chloride of lime, and is prepared by exposing moistened quicklime to the action of chlorine, when hypochlorite and chloride of calcium are formed, the former being the bleaching agent. By the action of an acid on good bleaching powder 30 per cent. of chlorine is liberated. Substances are bleached by alternately dipping them in dilute solutions of bleaching powder and of dilute sulphuric acid. Bleaching powder is also used to purify an offensive or infectious atmosphere.

BLEAK, a fish, the *leuciscus alburnus* of Cuvier, belonging to the family *cyprinidae*. It is a river fish five or six inches long, and is found in Great Britain.

BLEB, a blister, a thin tumor filled with a watery liquid arising upon the surface of the body. If idiopathic, it is called pemphigus. If produced by external irritation, or some similar cause, it is a vesicle.

BLEEDING, or **HEMORRHAGE**, one of the most serious accidents which can

happen to an animal, and constitutes the most anxious complication in surgical operations. As there is but a limited quantity of blood in the body (corresponding to about one-tenth of its weight), the sudden escape of a large portion of it is sufficient to cause death.

Arterial bleeding is recognized by the florid redness of the blood, and by its issuing from the cut vessel by jerks. There are exceptions to this, however. When an artery has been tied, and bleeding occurs from below the ligature, the flow of blood is continuous, and of a dark color.

The principal means of relief are: Immediate pressure, which may be applied by pressing the finger tip on the place whence the blood is seen to flow. This may be kept up by pads of lint, or a coin of convenient size wrapped in cloth, and secured with a bandage to the part. Pressure on the artery above, or as it comes to the cut part. Pressure on the inside of the upper arm, about midway between its front and back, will press the brachial artery against the bone, and arrest any bleeding from wounds of the forearm and hand. Pressure on the middle of the groin with a thumb placed crosswise will control the stream of blood in the femoral artery, so that none can escape from any wound of the lower limb below where the pressure is made. This pressure with the finger or thumb is very difficult to maintain with an adequate amount of firmness and continuity; hence it is well to substitute the handle of a door key wrapped in cloth. Pressure on the course of the vessel may be very efficiently effected by tying a handkerchief round the limb above where it is injured, and then inserting a stick, and twisting it sufficiently tight. Pressure on the main vessel leading to a limb is only a temporary method of stopping bleeding, since it is not only very painful to the patient, but fraught with danger to the limb, which may mortify if it be too long continued. Actual cautery, or hot iron, is occasionally useful in bleeding from a bone, or at some points where pressure cannot be efficiently applied.

Venous bleeding is recognized by the dark color of the blood, and its continuous flow. Pressure is generally found sufficient to arrest it, and it should be applied directly over the wounded part. In this case, pressure higher up the limb only does harm, by retarding the return flow of the circulation. Oozing from cut surfaces partakes more of the characters of venous than of arterial bleeding, as there is no vessel sufficiently large to demand the application of a ligature. The

actual cautery or cold may be used, or one of the many styptics—*e. g.*, perchloride of iron—may be especially recommended; it may be applied on lint or a sponge; or local astringents, such as alum and tannin, may be employed; there are also the puff ball, mushroom, agaric, and matico leaves, cobwebs, felt, etc.

In bleeding, of whatever kind, the posture of the patient is a matter of great importance. The recumbent position is associated with a diminished force of the circulation, and should, therefore, be adopted in all serious cases. If the bleeding occur in one of the limbs, the raising of the injured part is in itself often sufficient to cut short the loss of blood, and this postural treatment should in all cases be employed in addition to the special local remedies above described. Bleeding from internal organs, as the stomach or the lungs, is a very serious symptom, and must be immediately and carefully treated whenever it occurs.

BLEIBTREU, KARL AUGUST (blib'-troi), a German poet and novelist, born at Berlin, Jan. 13, 1859. He is one of the foremost representatives of the youngest German school in literature, and a pronounced realist. All his views are radical, as shown by the very titles of his works, *e. g.*, "Revolution in Literature" (1885); "Literature's Struggle for Life." He also wrote "Dies Iræ," "Napoleon at Leipsic," "Cromwell at Marston Moor." His dramas are "Lord Byron" (1888); "The Day of Judgment," "The Queen's Necklace," etc.

BLENDE, a native sulphide of zinc (ZnS). Composition: Sulphur, 32.12-33.82; zinc, 44.67-67.46; sometimes with small amounts of iron and cadmium. It occurs in regular tetrahedra, dodecahedra, and other monometric forms; it is found also fibrous, columnar, radiated, plumose, massive, foliated, granular, etc. Its color is either white, yellow, or brown black. Varieties of it exist in many places in this country; in Derbyshire, Cumberland, and Cornwall, England; as well as on the continent of Europe, etc. One variety is called by the miners blackjack. Blende is called also sphalerite. Dana divides it into (1) ordinary (containing blende or sphalerite, little or no iron); (2) ferriferous (containing 10 or more per cent. of iron); (3) cadmiferous (containing cadmium).

In mining, the word is applied to the above mentioned blackjack, treated by roasting and destructive distillation in combination with charcoal in a vessel from which the air is excluded. By ac-

cess of air the metal burns and passes off in vapor which condenses as the white oxide, which is collected and forms a pigment known as zinc white.

BLENHEIM (blen'em or blen'hīm), a village in Bavaria on the Danube. Near it was fought, Aug. 13, 1704, during the war of the Spanish Succession, the famous battle of Blenheim (or Höchstadt, from another village in the vicinity), in which Marlborough and Prince Eugene, commanding the allied forces of England and Germany (52,000 men), gained a brilliant victory over the French and Bavarians (56,000). The victors lost some 12,000 in killed and wounded; the vanquished 40,000, including prisoners, of whom Villars was one. Here, the French defeated the Austrians, June, 1800.

BLENHEIM DOG, a variety of spaniel, bearing a close resemblance to the King Charles breed, but somewhat smaller, so named from having been originally bred by one of the Dukes of Marlborough. It has a short muzzle, long, silky hair without any curl, and long, pendulous ears.

BLENNERHASSETT, HARMAN, an Englishman of Irish descent, noted for his connection with Aaron Burr's conspiracy, born in Hampshire, Oct. 8, 1764 or 1765; was educated at Trinity College, Dublin; studied law; and came to the United States in 1797. In the following year he built a beautiful residence on a little island in the Ohio river below Parkersburg where Aaron Burr was a guest after New York became unsafe for him to live in. Burr proposed his scheme for taking Mexico, where, in case of success, Burr was to be Emperor and Blennerhassett a duke and ambassador to England. Large sums were expended to fit out the expedition and when Burr was arrested, and Blennerhassett as a suspected person with him, creditors seized the island and home, and Blennerhassett found himself bankrupt. After this all projects failed with him. In his last years he was supported by the charity of a relative. He died on the island of Guernsey, Feb. 1, 1831. His wife was a daughter of Governor Agnew, of the Isle of Man, and the author of many poems, including "The Deserted Isle," etc.

BLENNIUS, a genus of spiny finned fishes, the typical one of the family *blenniidae*. The species are small, agile fishes of no economic value, often left behind in pools by the retreating tide. They have long dorsal and large pectoral fins, while their heads are often furnished with tentacles, simple or branched.

BLENNIORRHEA, a genus of diseases, including those which consist of mucous discharges, especially from the genital and urinary systems. Modern microscopical research claims to have shown that this class of diseases are the product of idiopathic conditions, such as catarrh, or of lack of cleanliness.

BLENNY, the English name of the several fishes belonging to the genus *blennius*.

BLÉRÉ (blā-rā'), a French town, in the department of Indre-et-Loire, on the Cher, 15 miles E. S. E. of Tours. In the vicinity is the Château Chénonceaux, built in the time of Francis I., and still in excellent preservation. It was given by Henry II. to his mistress, Diana de Poitiers, who was dispossessed on the death of Henry by Catherine de Medici. In the latter part of the 18th century it was frequented by Fontenelle, Voltaire, Rousseau, and all the wits of the time, who were drawn together by the then owner of the château, Madame Dupin, widow of a fermier général who died in 1799.

BLESBOK, an antelope of south Africa with a white marked face, a general purplish chocolate color, and a saddle of a bluish color; found in great numbers in the late Boer republics in south Africa and much hunted.

BLESSED THISTLE, the English name of several thistles. (1) *Cnicus benedictus*, formerly called *Centaurea benedicta*. Both the English name and the Latin specific appellation refer to the fact that formerly it was believed to destroy intestinal worms, to cure fevers, the plague, and even the most stubborn ulcers and cancers, an opinion for which there seems to have been no foundation whatever. (2) *Carduus benedictus* ["United States Pharmacopæia"], the blessed thistle of modern medicine, in which it has an honorable place as a tonic and diaphoretic. (3) *Carthamus lanatus* is also in some localities called the blessed thistle.

BLESSINGTON, MARGARET, COUNTESS OF, an Irish author, born near Clonmel, Sept. 1, 1789. She was the daughter of Edmund Power, an improvident man of good family, and at the age of 15 was married to a Captain Farmer, who died in 1817; and a few months after his death his widow married Charles John Gardiner, Earl of Blessington. In 1822 they went abroad, residing there till the Earl's death in 1829, when Lady Blessington took up her abode in Gore House, Kensington. Her residence be-

came the fashionable resort for all the celebrities of the time. She contributed to the "New Monthly Magazine," "Conversations with Lord Byron"; wrote numerous novels, including "The Belle of a Season," and the "Victims of Society"; and acted as editor for several years of "Heath's Book of Beauty," the "Keepsake," and the "Gems of Beauty." She died in Paris, June 4, 1849.

BLICHER, STEEN STEENSEN (blich'er), a Danish poet and novelist, born in Viborg in 1782. His first work was a translation of "Ossian" (2 vols., 1807-1809), and his first original poems appeared in 1814, but attracted little notice. He quickly won a national reputation with his novels, and in 1842 appeared his masterpiece of novel writing, "The Knitting Room," a collection of short stories in the Jutland dialect. He died in 1848.

BLIGHIA (named after Captain Bligh), a genus of plants belonging to the order *sapindaceæ* (soapworts). *B. sapida* is the ash leaved akee tree. Blighia is now considered only a synonym of cupania.

BLIGHT, a diseased state of cultivated plants, especially cereals and grasses.

BLIMBING, the Indian name of the fruit of *averrhoa bilimbi*, a small tree, family *oxalidaceæ*, called also cucumber tree, the fruit being acid and resembling a small cucumber. The carambola belongs to the same genus.

BLIND, KARL (blint), a German author and revolutionist, born at Mannheim, Sept. 4, 1826; studied law at Heidelberg. For his share in the risings in south Germany in 1848 he was sentenced to eight years' imprisonment, but while being taken to Mainz was liberated by the populace. After the reaction had again triumphed over the Continent, Blind found an asylum first in Belgium, and afterward in England, where he took an active part in Democratic propaganda. An enthusiastic advocate of German freedom and unity, he promoted the Schleswig-Holstein movement. As an author he has written on politics, history, and mythology, including lives of Ledru-Rollin, Deák, Freiligrath. He died May 31, 1907.

BLIND, MATHILDE, a German-English poet, born in Mannheim, March 21, 1847; went to England in 1849, and won fame by her writings, "The Prophecy of St. Oran, and Other Poems" (London, 1881); "Life of George Eliot" (1883);

"Madame Roland" (1886); "The Heather on Fire," a tale (1886); "Ascent of Man" (1889); "Dramas in Miniature" (1892); "Songs and Sonnets" (1893), and "Birds of Passage" (1895). She died in London, Nov. 26, 1896.

BLIND, THE, those who want, or are deficient in, the sense of sight. Blindness may vary in degree from the slightest impairment of vision to total loss of sight; it may also be temporary or permanent. It is caused by defect, disease, or injury to the eye, to the optic nerve, or to that part of the brain connected with it. Old age is sometimes accompanied with blindness, occasioned by the drying up of the humors of the eye, or by the opacity of the cornea, the crystalline lens, etc. There are several causes which produce blindness from birth.

As early as 1260 an asylum for the blind (L'hospice des Quinze-Vingts) was founded in Paris by St. Louis for the relief of the crusaders who lost their sight in Egypt and Syria; but the first institution for the instruction of the blind was the idea of Valentin Haüy, brother of the celebrated mineralogist. In 1784 he opened an institution in which they were instructed not only in appropriate mechanical employments, as spinning, knitting, making ropes or fringes, and working in pasteboard, but also in music, in reading, writing, ciphering, geography, and the sciences. For instruction in reading he procured raised letters of metal; for writing he used particular writing cases, in which a frame, with wires to separate the lines, could be fastened upon the paper; for ciphering there were movable figures of metal, and ciphering boards in which the figures could be fixed; for teaching geography maps were prepared upon which mountains, rivers, cities, and the boundaries of countries were indicated to the sense of touch in various ways, etc. Similar institutions were soon afterward founded in Amsterdam, Berlin, Brussels, Copenhagen, Dresden, Edinburgh, Liverpool, London, Vienna, and in many cities of the United States. There are now comparatively few large cities that do not possess a school or institution of some kind for the blind.

Various systems have been devised for the purpose of teaching the blind to read, some of which consist in the use of the ordinary Roman alphabet, with more or less modification, and some of which employ types quite arbitrary in form. In all systems the characters rise above the surface of the paper so as to be felt by the fingers. The type adopted by Haüy was the script or italic form of the Roman

letter. This was introduced into England by Sir C. Lowther, who printed the Gospel of St. Matthew in 1832 with type obtained from Paris.

In 1920, a most interesting and ingenious device, that enables the blind to "see" by ear was brought to the attention of the public. The invention was by Dr. Max Herz, a specialist of Vienna. It is based on a sound alphabet, adapted by the inventor from the Morse alphabet, eliminating the dash and using the dot in various combinations. The modus operandi is thus described: A phonograph record is made of a story in the sound language. The record is placed on an instrument resembling a phonograph, equipped with a sound box, and the blind person, after having familiarized himself with the alphabet, is able to read by ear rather than through the fingers, as by the Braille method. The alphabet is based on the single dot, two dots and four dots, variously combined. The phonograph record is made as follows: Using an instrument like a typewriter the operator punches holes in a narrow tape, each group of perforations being a letter in the dot alphabet. The tape is then run through an electric machine and the perforations are transferred in sound to a master record. Duplicate records may then be turned out in any number desired.

One great advantage of this new invention over the Braille method is that a book of 200 printed pages may be transferred to a record only six inches in diameter, while the same book reproduced in Braille would require a thousand pages. The entire works of Dickens and Shakespeare could be reproduced by the "typophone," as the invention is called, on records that would occupy a box about six inches high and as many inches square, while the same works in Braille would occupy a large part of a room. The Bible, for instance, in Braille requires several volumes, while six thin typophone records would contain the entire book. The expense of the latter would be only about twenty or thirty cents, while the same work in Braille would cost many dollars. Another advantage claimed for the new method is that it is very easy to learn, proficiency being only a matter of a few days, while facility in the old method is sometimes only attained after a year or two of study.

The reproducing instrument resembles a small phonograph and is kept in a wooden case, like a traveler's typewriter. As in the phonograph, there is a large circular disc, about 9 inches in diameter.

Above this disc there is another one about the size of a six-inch record. Connecting the two is a reduction gear. The blind man places the record in position and fastens the needle to the sound box as in an ordinary phonograph. In order to begin reading the book, he turns the large disc and the words of the story are then tapped out in the code. The reduction gear causes the record to rotate at a rate one thirty-sixth as slow as the lower disc is turned. The operator may read as slowly or as rapidly as he desires. There are about 65,000 blind persons in the United States. Of these about 60 per cent. are males.

In Dr. Moon's alphabet some of the characters are Roman, others are based on or suggested by the Roman characters. The Braille system is one in which the letters are formed by a combination of dots.

In the United States books have been printed for the blind in three different forms of embossed characters, known as the Braille, the line letter, and the New York point systems. All of these have been used in the different schools. The New York point system, invented by W. B. Wait, Superintendent of the New York Institution, has also been adapted to the printing of music, and in 1894 the entire Bible was printed in it by the American Bible Society. Mr. Wait also brought out in 1894 the kleidograph, an instrument of his invention, by which the blind can readily write in embossed characters, and also the stereograph, by which they can emboss metal plates for printing in embossed characters.

BLIND FISH, the name of several species of fish, family *amblyopsidæ*, inhabiting the American cave streams. They are all small, the largest not exceeding five inches. In the typical species (*amblyopsis spelæus*) of the Mammoth Cave of Kentucky, the eyes are reduced to a useless rudiment hidden under the skin, the body is translucent and colorless, and the head and body are covered with numerous rows of sensitive papillæ, which form very delicate organs of touch.

BLIND WORM (so called from the small size of its eyes), the English name of a reptile, the *anguis fragilis*, formerly considered a serpent, but now classed with the most aberrant of the lizards. It is more commonly called the slow worm. It is not venomous. It feeds on slugs.

BLISS, CORNELIUS NEWTON, an American merchant, born in Fall River, Mass., Jan. 26, 1833; was educated in New Orleans; engaged first in commission business, in Boston, and became head

of the dry goods commission house of Bliss, Fabyan & Co., New York City, in 1881. He was a member of the Pan-American Conference; Chairman of the New York Republican State Committee in 1877-1878; and Treasurer of the National Republican Committee in 1892 and 1896; declined to be a candidate for Governor of New York in 1884 and 1891; and was Secretary of the Interior Department in President McKinley's cabinet in 1897-1898. Treasurer National Republican Committee, 1900 and 1904. He died in 1911.

BLISS, DANIEL, an American missionary, born in Georgia, Vt., Aug. 17, 1823; was graduated at Amherst College in 1852, and at the Andover Theological Seminary in 1855; was ordained a Congregational minister, Oct. 17, 1855; engaged in missionary work in Syria in 1855-1862; and in 1866 became President of the Syrian Protestant College of Beirut. His publications include "Mental Philosophy" and "National Philosophy," both in Arabic. President Syrian Protestant College (1902). He died in Beirut, Syria, 1916.

BLISS, EDWIN ELISHA, an American missionary, born in Putney, Vt., April 12, 1817; graduated at Amherst College in 1837, and at Andover Theological Seminary in 1842; was ordained as a missionary in 1843, and joined the American Mission in Turkey, being stationed at Trebizond, 1843-1852; Marsovan, Armenia, 1852-1856; and at Constantinople after 1856. In addition to the ordinary work of a missionary he edited, 1865-1892, the "Messenger," published at Constantinople in the Turkish and Armenian languages, and compiled a number of text books, notably the "Bible Handbook," in Armenian. He died in Constantinople, Turkey, Dec. 29, 1892.

BLISS, FREDERICK JONES, an American explorer, born in Mt. Lebanon, Syria, Jan. 23, 1859; son of Daniel Bliss; was graduated at Amherst College in 1880, and at the Union Theological Seminary in New York in 1887; was principal of the preparatory department of the Syrian Protestant College of Beirut for three years; was appointed Explorer to the Palestine Exploration Fund in 1890, and is best known for his excavations and finds in Jerusalem in 1894-1897, and again in 1898-1900. From 1911 to 1914 he was dean for men at the University of Rochester. He was a member of the committee appointed by General Allenby to report on the condition of buried ancient buildings in Syria and Palestine in 1919. He has published

"Mounds of Many Cities," "Excavations at Jerusalem," etc.

BLISS, TASKER HOWARD, an American soldier; born in Lewisburg, Pa., Dec. 31, 1853. He graduated from West Point in 1875 and from the United States Artillery School in 1884. From 1885 to 1898 he was professor of military science at the United States Naval War College. He served in Cuba and



GEN. TASKER BLISS

Porto Rico in the Spanish-American War and became commandant of the Army War College in 1903. He was made Chief of Staff of the U. S. Army in 1917, succeeding Major Gen. Hugh L. Scott. During the World War he represented the United States at the sessions of the Inter-Allied war conferences, and in 1919 was one of the American delegates to the Peace Conference at Paris.

BLISTER, a topical application, which, when applied to the skin, raises the cuticle in the form of a vesicle, filled with serous fluid, and so produces a counter-irritation. The Spanish fly blister operates with most certainty and expedition, and is commonly used for this purpose, as well as mustard, hartshorn, etc.

BLISTER FLY, the name for any fly, using that term in its widest sense to designate any flying insect. The more common blister flies are beetles, and they are in consequence sometimes called blister beetles. That most frequently employed by medical men for raising blisters on the skin is the *lytta vesicatoria*,

formerly called *cantharis vesicatorius*. It feeds on the ash. It is indigenous in the south of Europe, and being, among other places, imported from Spain, is often called the Spanish fly.

BLISTER STEEL, steel of blistered appearance formed by roasting bar iron in contact with carbon in a cementing furnace. Two subsequent processes convert it into shear steel and cast steel.

BLIZZARD, a modern American word whose origin is in doubt. As applied to a severe snow storm the word came into general use in the American newspapers during the bitterly cold winter of 1880-1881, although some papers claim its use as early as the '70's. It is employed in the Western States to describe a peculiarly fierce and cold wind, accompanied by a very fine, blinding snow which suffocates as well as freezes men and animals exposed to it. One of the most severe of these storms recorded in the West was that of January, 1888, which extended from Dakota to Texas. The thermometer in some places fell from 74° above to 28° below zero, and in Dakota to 40° below. The number of deaths amounted to 235. The blizzard which will long be remembered in the Eastern States began March 11, 1888, and raged until the 14th, New York and Philadelphia being the cities most affected.

BLOCK, a pulley, or a system of pulleys rotating on a pintle mounted in its frame or shell with its band and strap. There are many kinds of blocks, as a pulley block, a fiddle block, a fish block, a fly block, a heart block, a hook block, etc. A block and tackle is the block and the rope rove through it, for hoisting or obtaining a purchase.

BLOCKADE. To blockade a port is to close the port to the entrance and exit of all traffic by sea. The right to establish a blockade exists only in time of war and may be exercised only by a **BELLIGERENT** (*q. v.*) and only against the ports of the opposing belligerent. Its purpose is to cut off the communications of the blockaded enemy and to prevent him from receiving supplies or reinforcements and from engaging in commercial or military exchanges of any kind. The restrictions of a blockade weigh heavily not only upon the blockaded belligerent, but upon the neutrals desiring to trade with him. In the interest of such neutrals, the limitations and restrictions provided by international law are many and are strictly enforced by the "prize courts" which determine the validity of captures of neutral ships in time of war. A blockade, to be legal, must be announced with such publicity

as shall insure its reaching all interested neutrals, and must be maintained by such forces and in such manner as shall make it effective. An "effective" blockade has been defined as one which results in serious danger of the capture or destruction of any vessel attempting to violate it. The mere fact that a vessel succeeds in passing the line of blockading ships does not prove that the blockade is not effective. But if entrance or exit can be made with something approaching impunity, the blockade is not legal and no penalty will lie against a ship charged with violating it.

Violation of blockade is not a crime, even in the eyes of the belligerent blockader; nor are the persons found on board a ship which is captured while attempting to "run" the blockade subject to treatment as prisoners of war. The ship and cargo are, however, subject to confiscation. To this rule there are modifications. A neutral ship which is actually in a port when the notification of blockade is received is allowed a reasonable time to withdraw, without penalty. Similarly, a ship which has sailed for a certain port which is not blockaded at the time of the sailing but which is placed under blockade before the ship in question reaches it, is not subject to penalty for attempting to enter the port in good faith and while still in ignorance of the blockade. Such a ship is not permitted to enter, but is told of conditions and directed to withdraw. If she again attempts to enter, she is a lawful prize if captured. Similarly, if it can be proved that the ship after sailing has received news of the blockade, as may well happen in these days of radio communications, she is a lawful prize if captured while attempting to enter. Still further, a ship which sails for a port known to be blockaded is a lawful prize if captured at sea while thousands of miles distant from the port. The intent to violate the blockade is in fact to violate it. Conversely, a vessel which has successfully passed the blockade outward bound is a lawful prize if captured before reaching her port of actual, not alleged, destination. The taint of violated blockade adheres to the cargo even though it has been transferred to another vessel, if the transfer has been made with a view to evading the penalty. During the American Civil War, it was a common practice for British ships with cargo destined for blockaded Confederate ports to clear for Nassau or Bermuda, British ports near the Confederate coasts, and from there to begin what they proposed to regard as a new voyage to the nearest Confed-

erate port. Thus during the long run across the Atlantic, they counted themselves safe from capture because bound for a British port and in danger only during the short run from Nassau, for example, to the coast of Georgia or Florida. Similarly, small fast vessels loaded with Confederate cotton would slip out of port, often in a fog, and if they succeeded in eluding the blockading forces would make a dash for Nassau and there trans-ship their cargo to other vessels which then sailed for England, claiming immunity from capture as British ships bound from one British port to another. To meet this subterfuge, the United States courts announced the doctrine of "continuous voyage," in which it was held that a *cargo* bound to or from a blockaded port did not lose the taint of violating the blockade either by breaking its voyage at an intermediate port or by transfer to another vessel. This doctrine was ultimately accepted by the British authorities as sound and is now a recognized principle of international law.

The pressure of a blockade, if conditions are such that it can be made complete, is often more compelling than the more directly exerted pressure of a military force. The blockade of the Confederacy during the Civil War practically sealed every port from Wilmington, N. C., to the mouth of the Rio Grande; and the South, thus thrown back upon its own very limited agricultural, industrial, and financial resources, was reduced to submission, not alone, as is generally supposed, by the victories of the Northern armies, but to almost a greater degree by the pressure of the naval blockade. It was the blockade of Germany by the Allied navies, not the successes of the Allied armies, that gave the Allies the victory in the World War. In each case, four years was required to bring about the exhaustion of the blockaded country, but in each case the end was inevitable from the beginning. And it is by the threat of blockade, disguised under the term "economic pressure," that it is proposed, in the latest plan for world peace, to compel governments to submit their grievances to arbitration.

During the recent World War, the laws of blockade like those of "visit and search," "contraband of war," and many others of the laws of warfare on the sea as previously established in international law, were modified arbitrarily to suit the convenience of the parties to the war, under the plea that changed conditions made it impracticable to adhere to the old laws. It is true that

many new conditions arose which had never been foreseen and that some deviation from the letter of the law became, if not altogether justifiable, at least expedient and inevitable. It is to be hoped that a new Hague Conference may be assembled in the not distant future and new rules drawn up, if such are found desirable, covering many questions growing out of the war, and among them the question of blockade.

BLOCK HOUSE, a fortified edifice of one or more stories, constructed chiefly of blocks or hewn timber. Block houses are supplied with loopholes for musketry and sometimes with embrasures for cannon, and when of more than one story the upper ones are made to overhang those below, and are furnished with machicolations or loopholes in the overhung floor, so that a perpendicular fire can be directed against the enemy in close attack. In the World War (1914-1918) the Germans used concrete block houses in northern France to defend their front lines.

BLOCK ISLAND, an island in the Atlantic off the coast of Rhode Island, to which it belongs: named from Adrian Block, a Dutch navigator who discovered it in 1616. There is a lighthouse at its S. E. extremity visible 21 miles. The island forms the township of New Shoreham, esteemed as a summer resort.

BLOCK PRINTING the method of printing from wooden blocks (producing block books), as is still done in calico printing and in making wall paper. See PRINTING.

BLOCK SYSTEM, in railroad parlance, the division of a railroad into a certain number of telegraphic districts, the distance between which is determined by the amount of traffic, each block station having signaling instruments by which the signal man can communicate with the operator on each side of him. When a train enters any block a semaphore signal is lowered, and no train is allowed to follow until the one in front has reached the end of the block, when the signal is raised and at the same time lowered for the block ahead, etc. The block systems used in Europe and in the United States generally employ mechanical and electrical devices for lowering and raising the signal.

BLODGET, SAMUEL, an American inventor, born in Woburn, Mass., April 1, 1724. He took part in the French and Indian War; was a member of the expedition against Louisburg, in 1745; and subsequently became a judge of the Court of Common Pleas, in Hillsboro

county, N. H. He was the inventor of an apparatus by which he recovered a valuable cargo from a sunken ship near Plymouth, Mass., in 1783. His success led him to go to Europe for similar enterprises, but he met with no encouragement. In 1793 he began the construction of the canal around Amoskeag Falls in the Merrimac which now bears his name. He died in Haverhill, Mass., Sept. 1, 1807.

BLOEMFONTEIN (blem-fon'tin), city and capital of the former Orange Free State (name changed by the British, May 29, 1900, to Orange River Colony), South Africa; on the Modder river, 200 miles W. by N. of Durban, the base of British operations in the war against the Boers. In the war between Great Britain and the South African and Orange Free State Republics in 1899-1900 it was the seat of important military operations. After the appointment of Lord Roberts to the supreme command of the British forces operating against the Boers, he led an expedition against the city and forced its surrender on March 13, 1900, President Steyn escaping capture. Pop. (1918) 15,752.

BLOIS (blwä), the capital of the French department of Loire-et-Cher, 99 miles S. S. W. of Paris, on the Loire. It consists of an upper town, a lower town, and several suburbs. The old castle, which has played an important part in French history, was restored by the Government in 1845. The main entrance is by a fine Gothic portal opening into a quadrangle, on the E. side of which is a pillared cloister, on the N. a pile of buildings in the Renaissance style, on the W. some unfinished buildings, and on the S. is the ancient part begun by the Dukes of Orleans. There is also a cathedral of late date, the Church of St. Nicholas (12th century), a bishop's palace, Roman aqueduct, etc. The castle was long occupied by the counts of the name; and became a favorite residence of the kings of France. Louis XII. was born, Francis I., Henry II., Charles IX., and Henry III. held court here. During the World War Blois was used as a depot and headquarters for the American Expeditionary Force. Pop. about 25,000.

BLOOD, the red circulating fluid in the bodies of man and the higher animals. It is formed from chyle and lymph when these substances are subjected to the action of oxygen taken into the lungs by the process of inspiration. It is the general material from which all the secretions are derived, besides which it

carries away from the frame whatever is noxious or superfluous. In man its temperature rarely varies from 36.6° C. =98° F., but in birds it sometimes reaches 42.8° C.=109° F. The blood in reptiles, amphibia, and fishes, and the circulating fluid in the invertebrata, is cold, that is, in no case more than a little above the temperature of the surrounding medium. The vessels which conduct the blood out of the heart are called arteries, and those which bring it back again veins. The blood in the left side of the heart and in the arteries, called arterial blood, is bright red; that in the right side of the heart and in the veins, called venous blood, is blackish purple. Viewed by spectrum analysis, the haemoglobin of arterial blood differs from that of venous blood, the former being combined with oxygen and the latter being deoxidized.

Blood has a saline and disagreeable taste, and, when fresh, a peculiar smell. It has an alkaline reaction. It is not, as it appears, homogeneous, but under a powerful microscope is seen to be a colorless fluid with little, round red bodies called blood disks or blood corpuscles, and a few larger ones called white corpuscles floating about in it. When removed from the body and allowed to stagnate it separates into a thicker portion called cruentum, crassamentum or clot, and a thinner one denominated serum. See BLEEDING, BLOOD LETTING, etc.

In law, whole blood is descent not simply from the same ancestor, but from the same pair of ancestors, while half blood is descent only from the one. The corruption of blood is the judicial stripping it of the right to carry with it up or down the advantage of inheritance; its purification or restitution is the restoration to it of the privilege of inheritance.

BLOOD, THOMAS (commonly called Colonel Blood), born in Ireland about 1618, was a disbanded officer of Oliver Cromwell, and lost some estates in Ireland at the Restoration. His whole life was one of plotting and adventure, though it is probable that he acted a double part, keeping the Government informed of so much as might secure his own safety. His most daring exploit was an attempt to steal the crown jewels (May 9, 1671) from the Tower. He was seized with the crown in his possession, but was not only pardoned by Charles, but obtained forfeited Irish estates of £500 annual value. He died in London, in 1680.

BLOODEBIRD (*myzomela sanguinolenta*), an Australian species of honey-

sucker, so called from the rich scarlet color of the head, breast and back of the male.

BLOOD, COUNCIL OF, the name popularly applied to the Council of Troubles, established by the Duke of Alva, in the Netherlands, in 1567. In the first three months alone its victims numbered 1,800, and soon there was hardly a Protestant house in the Netherlands that had not furnished a victim.

BLOOD FLOWER, the English name of the *hæmanthus*, a genus of plants belonging to the order *amaryllidaceæ* (amaryllids). The allusion is to the brilliant red flowers. The species, which are mostly from the Cape of Good Hope, are ornamental plants.

BLOOD-HOUND, a variety of hound or dog, so called from the ability which it possesses to trace a wounded animal by the smell of any drops of blood which may have fallen from it. It is the *canis familiaris*, variety *B. sagax*, of Linnaeus, now called variety *sanguinaria*. It is the sleuth-hound of the Scotch. It has large, pendulous ears, a long curved tail, is of a reddish tan color, and stands about 28 inches high. The breed is not now often pure. There are other subvarieties, especially the Cuban blood-hound, used in the Maroon wars in Jamaica during the 18th century, as well as in tracking criminals in the United States. The African blood-hound is used in hunting the gazelle.

BLOODLESS SURGERY, the so-called bloodless surgery brought prominently before the public by the visit to this country of Dr. Adolf Lorenz of Vienna; in 1902, was used during the above trip in the treatment particularly of congenital dislocation of the hip, a condition in children which often leads to serious deformity. But Lorenz advocates the method for many other conditions. In an address before the New York Academy of medicine during his American tour the doctor mentioned the following conditions as amenable to his "modeling redressment" as he calls his manipulations: hip deformities, knee contractures, all deformities of the foot, and wry neck. The Lorenz method consists essentially of a tearing of muscles and ligaments, followed by replacement of the displaced bone. The usual or bloody method consists of a cutting of the tissues. As a matter of fact the bloodless surgery is often about as bloody as when the knife is used, the only difference being that the blood in the former case flows out among the tissues instead of

appearing on the surface through the knife wound. The Lorenz method is not without danger. It appears to be useful in certain cases, but the knife is preferred by the average surgeon and orthopedist in most cases.

BLOOD LETTING, a method of relieving the human system in states of general or local plethora by the abstraction of blood. General plethora is best treated, according to this method, by withdrawing a considerable quantity of blood from the arteries (arteriotomy) or veins (venesection). Local engorgement, or hyperæmia, of a part is usually treated by abstracting blood from the smallest sized vessels, or capillaries, present in the skin, by the methods of scarification or leeching. In these cases, the removal of blood from the superficial textures diverts the blood stream in part from underlying tissues, and thus reduces the tendency to inflammatory action in the deeper structures. In general blood letting the object is to reduce the strength of the blood stream throughout the whole system, and thus to diminish the acuteness of feverish conditions. The most usually employed method of accomplishing this is by the opening of one of the superficial veins of the arm, and allowing a sufficient quantity of blood to escape from the blood vessel thus operated upon. The amount of blood actually abstracted in blood letting must depend on the age of the patient and the nature of the case. The operation would be scarcely necessary if less than a quarter of a pint is to be removed, and it is now rare to remove more than one pint at one operation, however severe the case in which it is employed. See BLEEDING.

BLOOD POISONING, a name loosely used of pyæmia and allied diseases. It is also used popularly in a wider sense for the results on the human system of poison germs from malaria, bad drains, etc.; or for the condition of the blood caused by such ailments as Bright's disease of the kidneys, etc.

BLOOD RAIN, rain nearly of the color of blood, and which many of the unscientific suppose to be actual blood. It arises either from minute plants, mostly of the order *algæ*, or from infusorial animaleculæ. It is akin to red snow, which is similarly produced. The word also applies to a bright scarlet alga or fungus, called *palmella prodigiosa*, sometimes developed in very hot weather on cooked vegetables or decaying fungi.

BLOOD ROOT (*sanguinaria canadensis*), a plant of Canada and the United

States, belonging to the poppy order, and so named from its root stock yielding a sap of a deep orange color. Its leaves are heart-shaped and deeply lobed, the flower grows on a scape and is white or tinged with rose. The plant has acrid narcotic properties, and has been found useful in various diseases. *Geum canadense*, another American plant used as a mild tonic, is also known as blood root.

BLOOD STONE, a variety of jaspery quartz, flecked with red spots like drops of blood.

BLOOD VESSELS, the tubes or vessels in which the blood circulates.

BLOOD WOOD, a name of several trees. Indian bloodwood (*lagerstræmia reginae*), is a large tree of the henna family, with wood of a blood-red color, used for many purposes. It is called also jarool.

BLOOD WORT, same as blood root (*sanguinaria*).

BLOODY ASSIZES, those held in England, by Judge Jeffreys, in 1685, after the suppression of Monmouth's rebellion. Upward of 300 persons were executed after short trials; very many were whipped, imprisoned and fined; and nearly 1,000 were sent as slaves to the American plantations.

BLOODY MARY, an epithet popularly applied to Mary, Queen of England, on account of the persecutions of the Protestants during her reign.

BLOOM, a lump of puddled iron, which leaves the furnace in a rough state, to be subsequently rolled into the bars or other material into which it may be desired to convert the metal. Also a lump of iron made directly from the ore by a furnace called a bloomery.

BLOOMFIELD, a township in Essex co., N. J., on the Delaware, Lackawanna and Western and the Erie railroads, the Morris canal, and trolley lines connecting with Newark, the Oranges, Jersey City, and other cities; 10 miles N. W. of New York. It was founded in 1685 under the name of Watsessing and received its present name from Gen. Joseph Bloomfield in 1796. It is the seat of a German Presbyterian Theological Seminary and Mountainside Hospital; contains the residences of many New York business men; and is engaged in the manufacture of church and cabinet organs, woolen goods, hats, shoes, rubber goods, tissue and photographic paper, saddlery, hardware, electric elevators, and a variety of brass

goods. It has 4 banks and newspapers. Pop. (1910) 15,070; (1920) 22,019.

BLOOMINGTON, city and county-seat of McLean co., Ill.; on several important railroads; 60 miles N. N. E. of Springfield. It is the seat of the Illinois Wesleyan University (Methodist Episcopal), a Roman Catholic College, two hospitals, four sanitariums, and the general offices of the Chicago and Alton railroad. The Illinois State Normal University and the State Soldiers' Orphans' Home are located at Normal, two miles from the city. Bloomington has electric light and street railway plants, water-works supplied from an artesian well, public library, National banks, railroad shops, and manufactories of machinery, stoves, farming implements, patent medicines, brick and tile, etc. Pop. (1910) 25,763; (1920) 28,725.

BLOOMINGTON, city and county-seat of Monroe co., Ind.; on the Chicago, Indianapolis and Louisville, and the Indianapolis Southern railroads; 60 miles S. S. W. of Indianapolis. It is in a limestone and quarrying region; is the seat of the Indiana State University; and besides its farming and quarrying interests has important manufacturing concerns, especially in the lines of leather and hardware. The city has the Monroe County Library, a National bank, and several daily and weekly periodicals. Pop. (1910) 8,838; (1920) 11,595.

BLOOMSBURG, a town and county-seat of Columbia co., Pa.; on the Susquehanna river, the Pennsylvania canal, and several railroads; 40 miles W. of Wilkesbarre. It is in an iron and limestone region; contains a number of iron furnace foundries, silk mills, brass and copper tube works, furniture and desk factories, carpet factories, etc.; is the seat of the State Normal School and a literary institute. Pop. (1910) 7,413; (1920) 7,819.

BLOUET, PAUL (blö-ä'), (MAX O'RELL), a French lecturer and author, born in Brittany, France, March 2, 1848. During his early life he was an officer of cavalry in the French army, but in 1873 went to England and became a teacher. After the publication of his first book, "John Bull and His Island" (1883), he devoted himself to literature. He made several lecturing tours of the United States. His works include "John Bull and His Daughters" (1884); "Jonathan and His Continent" (1888, with Jack Allyn); "A Frenchman in America" (1891), etc. He died May 25, 1902.

BLOW-FLY, the name popularly given to such two-winged flies as deposit eggs

in the flesh of animals, thus making tumors arise. Several species of caliphora do this, so do breeze flies, etc.

BLOWING MACHINE, an apparatus for producing an air blast for metallurgical purposes. The earliest blowing machine was, doubtless, some form of the common bellows.

Blowing Engines.—For blast furnaces and for Bessemer steel converters, blowing engines of large size are employed. In the former, the strength of the blast sometimes is as high as 10 pounds per square inch. For the Bessemer converter, where a much greater pressure is required, it occasionally reaches 30 pounds per square inch. A blowing engine consists of a steam cylinder, an air cylinder, and a large air chamber, to insure a uniform blast. Sometimes the latter is dispensed with, and large main pipes used instead. The blowing cylinder is of cast iron, with an air-tight piston, which, as it ascends and descends with the motion of the engine, alternately inhales and expels the air at each end.

Trompe.—In the Catalan forges of Spain, the south of France, and some parts of the United States, there is a very ingenious water blowing machine in use called a trompe; but it can only be advantageously employed where a fall of a few yards of water is available. A cistern to act as a reservoir for the water; pipes (generally two in number), through which it descends; and a wind chest to allow the air and water to separate, constitute the essential parts of the apparatus. It is put in operation by lifting the wedge with a lever; this allows the water to rush down the pipe, and, in doing so, draws in air through sloping holes, called aspirators, at the throat of the pipe. A continuous current of water and air is thus supplied to the wind chest, which is provided with an opening for the escape of the water, while the air passes out in a regular stream by the nozzle pipe. The height from which the water falls determines the tension of the blast; but the height seldom exceeds 27 feet, which gives a pressure of from $1\frac{1}{2}$ to 2 pounds to the square inch. The separation of the air from the water is greatly promoted by the current impinging on the platform.

Fans.—The fan is another machine for producing blasts of air. It is employed for such purposes as the melting of pig iron in foundries and for forge fires. It is also used as an exhaust to withdraw full air from mines, public buildings, and ships. For mines it is occasionally of a very large size. The win-

nowing of corn is another application of it. The common blast fan is like a wheel with the arms tipped with vanes or blades, instead of being joined by a rim, and it is placed usually in an eccentric position, inside a chest, with central openings on each side for the admission of air. It is generally driven by steam power, and as it revolves, air is sucked in at the center, drawn toward the tips, and impelled forward through the exit pipe.

Rotary Pressure Blowers.—These are machines introduced in comparatively recent years. They act by regular displacement of the air at each revolution, since their pistons or drums closely fit their cases. In this respect they differ from fans, because, although there were no outlet for the blast, a fan could be kept revolving, but in such a case a pressure blower would stop.

BLOWPIPE, a small instrument used in the arts for glass blowing and soldering metals, and in analytical chemistry and mineralogy, for determining the nature of substances by the action of an intense and continuous heat. Its utility depends on the fact, that when a jet of air or oxygen is thrown into a flame, the rapidity of combustion is increased, while the effects are concentrated by diminishing the extent or space originally occupied by the flame.

The blowpipe generally consists of a conical tube of metal, about eight inches long, closed at the wider or lower end, but open at the narrow or upper end, which latter constitutes the mouthpiece, and is turned over to admit of the lips closing perfectly round it. Near the lower end, a small tube, fitted with a small platinum tip, is inserted in the large tube—the space below being intended as a chamber for condensing the moisture of the breath, and through this tip a fine current of air can be projected against the flame experimented with.

Where high temperatures are required mechanical blowpipes are resorted to.

Substances under examination before the blowpipe are generally supported either on wood-charcoal or platinum—the latter in the condition of wire or foil. In applying the blowpipe test, the body to be examined is either heated alone, or along with some flux or fusible substance; this being added, in some cases, for the purpose of assisting in the reduction of metals from their ores and other compounds: in others, for the production of a transparent, glassy bead, in which different colors can be readily observed. When heated alone, a loop of platinum wire, or a piece of charcoal, is generally

employed as a support; the former when the color of the flame is to be regarded as the characteristic reaction, the latter when such effects as the oxidation or reduction of metallic substances are to be observed.

The following metals are reduced from their compounds when heated with carbonate of soda on charcoal in the inner flame of the blowpipe: viz., nickel, cobalt, iron, molybdenum, tungsten, copper, tin, silver, gold, and platinum. When compounds of zinc, lead, bismuth, arsenic, antimony, tellurium, and cadmium are similarly treated, these metals are also formed, but being volatile, pass off in vapor at the high temperature to which they are exposed.

The blowpipe has been long used by goldsmiths and jewelers for soldering metals, and by glass blowers in fusing and sealing glass tubes, etc.; it has also been applied in qualitative analysis for many years, but more recently chemists have devoted their attention to its use, and have even employed it with great success in quantitative chemical analysis.

The oxyhydrogen blowpipe is an arrangement by which a jet of oxygen and hydrogen, in the proportions to form water, is ignited and directed against any object. The most intense heat is produced, most of the metals being volatilized when placed in it, and even the diamond changes into ordinary carbon, and is burned when exposed to its flame. When a cylinder of quicklime is heated by it, a most dazzling light is produced, rivalling the electric light in brilliancy, and known as the calcium light.

BLUBBER, the fat of whales and other large sea animals, from which train oil is obtained. The blubber lies under the skin and over the muscular flesh. It is eaten by the Eskimos and the sea-coast races of the Japanese Islands, the Kuriles, etc. The whole quantity yielded by one whale ordinarily amounts to 40 or 50 but sometimes to 80 or more hundred weights.

BLÜCHER, GEBHARD LEBERECHT VON (*blücher*), a distinguished Prussian General, born at Rostock, Mecklenburg-Schwerin, Dec. 16, 1742. He entered the Swedish service when 14 years of age and fought against the Prussians, but was taken prisoner in his first campaign, and was induced to enter the Prussian service. Discontented at the promotion of another officer over his head, he left the army, devoted himself to agriculture, and acquired an estate. After the death of Frederick II. he became a Major in his former regiment, which he commanded with distinction on

the Rhine in 1793 and 1794. After the battle of Kirrweiler in 1794 he was appointed Major-General of the Army of Observation stationed on the lower Rhine. In 1802, in the name of the King of Prussia, he took possession of Erfurt and Mühlhausen. Oct. 14, 1806, he fought at the battle of Auerstädt. After the Peace of Tilsit he served in



GENERAL VON BLÜCHER

the Department of War at Königsberg and Berlin. He then received the chief military command in Pomerania, but at the instigation of Napoleon was afterward, with several other distinguished men, dismissed from the service. In the campaign of 1812, when the Prussians assisted the French, he took no part; but no sooner did Prussia rise against her oppressors than Blücher, then 70 years old, engaged in the cause with all his former activity, and was appointed commander-in-chief of the Prussians and the Russian corps under General Winzergerode. His heroism in the battle of Lützen, Bautzen and Hanau, Katzbach, and Leipsic, added to his glory. He was now raised to the rank of Field-Marshal, and led the Prussian army which invaded

France early in 1814. March 31, Blücher entered the capital of France. His King created him Prince of Wahlstadt, and gave him an estate in Silesia. On the renewal of the war in 1815, in chief command, he led his army into the Netherlands. June 16 Napoleon threw himself upon him, and Blücher, on the 16th, was defeated at Ligny. In the battle of the 18th Blücher arrived at the most decisive moment upon the ground, and taking Napoleon in the rear and flank assisted materially in completing the great victory of Belle Alliance or Waterloo. He was a rough and fearless soldier, noted for his energy and rapid movements, which had procured him the name of Marshal Vorwärts (Forward). He died at Kriebowitz, Silesia, Sept. 12, 1819.

BLUE, one of the seven colors into which the rays of light divide themselves when refracted through a glass prism, seen in nature in the clear expanse of the heavens; also a dye or pigment of this hue. The blue pigments in common use by artists are few in number, and consist of native and artificial ultramarine, cobalt, indigo, and Prussian blue. Genuine ultramarine, prepared from the mineral lapis lazuli, and ordinary cobalt blue, sold for artists' work, are permanent colors. Prussian blue and indigo are highly useful colors, since it is only these that yield dark blues, and only from them, mixed with yellows or browns, that strong greens can be obtained.

BLUE BEARD, the name of the blood-thirsty husband in the familiar tale of "Blue Beard," best described in Perrault's "Tales" (1697). The original of this monstrous personage was a character celebrated in Breton legend, Gilles de Laval, Baron de Retz (1396-1440), famous in wars of Charles VII. According to tradition he used to entice the children of the peasants into his castle, and there sacrifice them to the Devil. He was condemned to death, strangled, and his corpse burned at the stake at Nantes in 1440. Another Breton legend represents de Retz with a red beard about to marry a beautiful girl after having already made away with seven wives. The bride expostulates at the altar. De Retz offers her all his possessions, finally his body and soul. "I accept," cried the bride at the same time transformed into a blue demon and making a sign that changes de Retz's beard from red to blue. Henceforth he belongs to Hell, and is the dread of the country under the name of Blue Beard.

BLUEBELL (so called from the color and shape of the flowers), the English

name of the plant genus *agraphis*, and especially of the wild hyacinth (*agraphis nutans* of Link, *scilla nutans* of Smith, *hyacinthus nonscriptus* of Linnæus). The bluebell of Scotland is the round-leaved bell flower or harebell (*campa-nula rotundifolia*).

BLUEBERRY, a name given in the United States to the genus *vaccinium*, that which contains the bilberry, called in Scotland the blaे berry (*vaccinium myrtillus*). The commonest species are *V. pensylvanicum* and *V. resinosum*.

BLUE BIRD, a beautiful bird, the *sylvia sialis* of Wilson. Its whole upper parts are sky blue, shot with purple, with its throat, neck, breast, and sides reddish chestnut, and part of its wings and its tail feathers black. It is about 7½ inches long. It has a soft, warbling note, which is one of the first harbingers of spring.

BLUE BOTTLE, a two-winged fly, *musca (lucilia) cæsar*, the body of which has some faint resemblance to a bottle of blue glass. Also the *centaurea cyanus*, more fully named the corn blue bottle, from its being found chiefly in corn fields. It belongs to the order *asteraceæ* (composites), and the sub-order *tubulifloræ*. It is from 2 to 3 feet high with florets of the disk, which are small and purple, and those of the ray few, larger and bright blue. It is common in the United States and Europe.

BLUE DISEASE, a condition in which the most prominent symptom is a peculiar discoloration of the skin and mucous membranes, due to the circulation of dark or venous blood in the vessels. It is also called cyanosis.

BLUE EYE (*entomomyza cyanotis*), a beautiful little bird, abundant and very generally dispersed in New South Wales, although not found in Victoria. It is one of the honey eaters, or honey suckers, and is sometimes called the blue-cheeked honey eater.

BLUEFIELD, a city of West Virginia in Mercer co. It is on the Norfolk and Western railroad. It is an important industrial center and has railway shops, flour mills, and several wholesale houses. The city is the distributing center for the Pocahontas coal fields. It is the seat of the State Normal School and has two sanitaria, an opera house, a Federal building, and other public buildings. Pop. (1910) 11,188; (1920) 15,282.

BLUEFIELDS, town, seaport, and capital of the former Mosquito Indian Reservation; now the department of Zelaya, Nicaragua, on the Atlantic coast near

the mouth of the Bluefields river, and 165 miles E. of Managua. The reservation lies along the Atlantic coast extending S. almost to Greytown. For many years Great Britain maintained a protectorate over the reservation, which at one time belonged to Honduras. In 1893, when the war broke out between Nicaragua and Honduras, the United States Government sent a war vessel to Bluefields to protect the large American commercial interests there. Early in the following year Nicaragua took possession of the town and proclaimed martial law. Chief Clarence protested to Great Britain against the usurpation of his rights and British war vessels were sent to the reservation and re-established Clarence in authority. During 1893-1896 the reservation and its capital were the subjects of much controversy between the United States, Great Britain, Nicaragua, and the natives of the reservation. Pop. about 5,000.

BLUE FISH, a noteworthy food and game fish (*Pomatomus saltatrix*) of the American Atlantic coast from the Gulf northward, also called the skip mackerel, and, when young, snappers.

BLUE GRASS, a grass cultivated for pasturage in northern and central Kentucky, deriving its name from the underlying strata of blue limestone which gives it a luxuriant growth, and distinguished from other species by flat panicles, smooth culms and sheaths, and short, blunt ligules. The blue grass region occupies about 10,000 square miles in northern Kentucky. The soil is very rich, and agriculture, especially the raising of tobacco and hemp, is carried on with great success. The pastures support the horses and live stock for which Kentucky is famous.

BLUE ISLAND, a city of Illinois in Cook co. It is on the Illinois Central, the Chicago, Rock Island and Pacific, the Chicago and Grand Trunk, and the Baltimore and Ohio Chicago Terminal railroads. The city is a suburb of Chicago and is about 2 miles south of the limits of that city. It is an important industrial center and has stone quarries, wire works, smelting works, etc. Pop. (1910) 8,043; (1920) 11,424.

BLUE JAY (*cyanocitta cristata*), a common North American bird of the crow family, and occupying in the New World the place held by the jays (*garulus*) of the Old. In the United States the blue jay is sometimes persecuted, sometimes protected. They are mischievous birds, but devour large numbers of injurious caterpillars. The com-

mon blue jay has a wide distribution, and there are several other North American species. The long-tailed blue jays belong to a rarer genus (*Xanthura*) found in Central and in South America.

BLUE MANTLE, one of the English pursuivants at arms, connected with the Heralds' College.

BLUE MOUNTAINS, a beautiful wooded range of mountains in Oregon, from 8,000 to 9,000 feet high, which, with the Powder River Mountains, separate the Columbia valley from the Great Basin.

BLUE MOUNTAINS, the central mountain range of Jamaica, the main ridges of which are from 6,000 to 8,000 feet high. Also a mountain chain of New South Wales, part of the great Dividing Range. The highest peaks rise over 4,000 feet above the sea. The range is now traversed by a railway, which attains a maximum height of 3,494 feet.

BLUE PILL (*pilula hydrargyri*), a pill made by rubbing two ounces of mercury with three of confection of roses till the globules disappear, and then adding one of licorice root to form a mass. It is given when the secretion of the liver is defective as a purgative.

BLUE POINT, the S. extremity of Patchogue Bay, Long Island, N. Y., which lends its name to the well known oysters—blue points.

BLUE RIDGE, the most easterly range of the Allegheny Mountains. It forms the continuation of the chain called South Mountain in Pennsylvania and Maryland. It is known as the Blue Ridge till it crosses the James river; thence to North Carolina as Allegheny Mountains; and in North Carolina again as Blue Ridge.

BLUE SKY LAWS, regulations by which various States of the Union have attempted to protect their citizens against investment in fraudulent or worthless securities. Kansas was the pioneer in the movement, and many other States quickly followed her example. California, in 1917, required that every person or company selling securities within the State, whether they were originally issued in the State or elsewhere, must secure a certificate authorizing said person or company to act as a broker. All advertising matter relating to the sale of securities must undergo a searching scrutiny by the State Commission. In Minnesota, in the same year, a new law created a State Securities Commission, consisting of the public examiner, the attorney-general and the State superin-

tendent of banking, and required all dealers not only to be licensed, but to advise the commission in advance of all projected offerings. Any offer considered unfair or fraudulent might be suspended, pending investigation, and later, if the suspicions were justified, prohibited altogether. A law passed in Illinois, to become effective Jan. 1, 1918, differed from the Minnesota statute in that the Illinois law prohibited the sale of any securities in the State until the dealer had been licensed, while in Minnesota the dealer was only required to give information that might later result in prohibition of sales if the securities should not bear scrutiny. It is evident that under the latter provision a certain amount of business might be done before the prohibition was finally decreed. Pennsylvania, Ohio, Michigan, Iowa, and South Dakota have passed laws patterned largely on similar plans. In a notable decision, under date of Jan. 22, 1917, the United States Supreme Court upheld the position of the States in a case involving Ohio, Michigan, and South Dakota laws.

BLUE TIT, or **BLUE TITMOUSE**, a bird, called also blue tomtit, blue cap, blue bonnet, hick mall, billy biter and ox eye. It is the *parus caeruleus* of Linnaeus. It has the upper parts of the head light blue, encircled with white; a band around the neck and the spaces before and behind the eye of a duller blue; back light, yellowish green, the lower parts pale, grayish yellow; the middle of the breast dull blue. The male is more brightly colored than the female. It builds its nest in the chink of a wall, under eaves or thatch, or in a hole of a tree, and lays from 6 to 8 eggs of a reddish color.

BLUFFTON, a city of Indiana, the county-seat of Wells co. It is on the Lake Erie and Western, the Toledo, St. Louis and Kansas City, and other railroads, and on the Wabash river. It is the center of an important agricultural region and has a large trade in grain. Its industries include foundry and machine shops, a piano factory, manufactures of barrels, clay pottery, tile, etc. Pop. (1910) 4,987; (1920) 5,391.

BLUM, ROBERT, a German Liberal leader, born in very humble circumstances at Cologne, Nov. 10, 1807; was secretary and treasurer of a theater at Cologne, and subsequently at Leipsic, until 1847, when he established himself as bookseller and publisher. His leisure was devoted to literature and politics, and in 1840 he founded at Leipsic the Schiller Society, which celebrated the

poet's anniversary, as a festival in honor of political liberty. When the revolutionary movement broke out in 1848, Blum was one of its most energetic leaders. He was elected one of the Vice-Presidents of the Provisional Parliament at Frankfort, and as such ruled that turbulent assembly. In the National Assembly he became leader of the left, and was one of the bearers of a congratulatory address from the Left to the people of Vienna, when they rose in October. At Vienna he joined the insurgents, was arrested, and was shot on Nov. 9, 1848.

BLÜMLISALP (blüm'lēs-älp), a group of mountain peaks in the Bernese Oberland in the S. of Switzerland, S. W. of the Jungfrau. The highest peak, the Blümlisalphorn, is about 12,000 feet in altitude.

BLUNDERBUSS, a short gun, unrifled and of large bore, widening toward the muzzle. It is by no means to be ranked with arms of precision, but is loaded with many balls or slugs, which scatter when fired, so that there is a certainty of some one of them hitting the mark.

BLUNT, WILFRID SCAWEN, an Irish poet, born at Crabtree Park, Sussex, in 1840. He was attaché of legation at The Hague, Athens, Madrid, Buenos Ayres, and elsewhere. He supported Arabi Pasha in the revolt in Egypt in 1881; and was imprisoned in 1888 for his insurrectionary actions in Ireland. He is author of "Sonnets and Songs by Proteus" (London, 1875); "The Love Sonnets of Proteus" (1881; new ed. 1885); "Ideas About India" (1885); and "Esther: a Young Man's Tragedy" (1895). "Secret History of the English Occupation of Egypt" (1907); "Gordon at Khartoum" (1911); "The Land War in Ireland" (1912); "Complete Works" (1914).

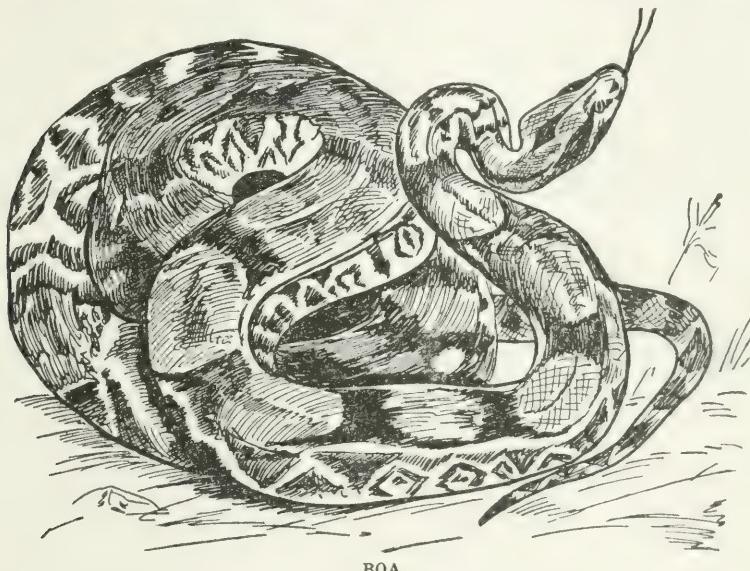
BLUNTSCHLI, JOHANN KASPAR (blöntsh'lē), a Swiss jurist and statesman, born in Zurich, March 7, 1808; became professor in the newly founded university in that city in 1833. He took an active part in the political struggles that divided his country. In 1839 he led the Conservatives. He was a Councilor of State, and became a member of the Government and of the Federal Directory, and afterward worked for the formation of a moderate Liberal Conservative party in Switzerland. In 1848 he went to Munich as Professor of Civil and International Law. There he published his "Allgemeines Staatsrecht" (5th ed. 1876), on which his reputation as a

jurisconsult chiefly rest. In 1861 he removed to Heidelberg University, and became a Privy Councilor of Baden, actively forwarding all Liberal measures in the state. He acted several times as president of the Protestantenverein, and died after delivering a speech at the synod of Baden at Karlsruhe, Oct. 21, 1881. He was the author of valuable histories of Zurich and of the Swiss Confederation, and of a number of works on law.

BLYTHEVILLE, a city of Arkansas, the county-seat of Mississippi co. It is on the Frisco Lines, the Arkansas Southern, and other railroads. It is the center of an important cotton and agricultural region and has manufactures of hard-

nada, dethroned his father, Ab-ul-Hasan, in 1481, and two years later was defeated and taken prisoner by the Castilians near Lucena. He was set free on condition of paying tribute, and returned to Granada to struggle with his father and with his heroic uncle, Ez-Zaghah, for the throne. The fall of Malaga and Baza was but the prelude to the siege of the capital. The spot from which Boabdil looked his last on Granada still bears the name of *el ultimo sospiro del Moro*, "the last sigh of the Moor." He soon crossed to Africa and flung away his life in battle.

BOA CONSTRICCTOR, the best known species of the genus *boa*. The specific



BOA

wood products and lumber. Pop. (1910) 3,849; (1920) 6,447.

BOA, an enormous snake, said to have been anciently found in India. None, however, are at present known to exist there more than 6 feet long. The spelling *bova* is from *bos, bovis*—an ox. *Boa* is also the name of a genus of serpents, the typical one of the family *boidae*. The species are found native only in America, the analogous genus in the East popularly confounded with it, namely *python*, being distinguished from it by the presence of intermaxillary teeth. This word is likewise applied to a long fur tippet or comforter worn by ladies around their necks.

BOABDIL (properly *Abu-Abdallah*, and nicknamed *Ez-Zogoiby*, "the unlucky"), the last Moorish King of Gra-

name constrictor, meaning binder or drawer together, refers to the method through which the animal destroys its prey by coiling itself round it and gradually tightening the folds. It is about 30 feet long. It is found in South America.

BOADICEA, Queen of the Iceni, in Britain, during the reign of Nero. Having been treated in the most ignominious manner by the Romans, she headed a general insurrection of the Britons, attacked the Roman settlements, reduced London to ashes, and put to the sword all strangers to the number of 70,000. Suetonius, the Roman general, defeated her in a decisive battle (A. D. 62), and Boadicea, rather than fall into the hands of her enemies, put an end to her own life by poison.

BOANERGES, a Greek word translated in Mark iii: 17, "sons of thunder." It is of doubtful etymology, but is probably the Aramaic pronunciation of Hebrew *beni regesh*, *regesh* in Hebrew meaning tumult or uproar, but in Arabic and Aramaean thunder. It is an appellation given by Christ to two of His disciples, the brothers James and John, apparently on account of their fiery zeal.

BOAR, the uncastrated male of the swine (*sus scrofa*), or of any other species of the genus. The wild boar is the male of a swine either aboriginally wild or whose ancestors have escaped from domestication. The common wild boar

through the Middle States till 1774, and then, returning to England, continued his itinerant ministry. He is known as one of the founders of Methodism in the United States. He died in Cork, Ireland, Oct. 4, 1782.

BOAR FISH (*capros*), a genus of fishes in the *carangidae* or horse mackerel family of *acanthopterygii* or bony fishes with spinous rays. The protrusible mouth presents a resemblance to a hog's snout, as the name suggests. The body has an oval compressed form like that of the related John Dory. The common boar fish (*C. aper*) is a well-known inhabitant of the Mediterranean, rarely



WILD BOAR

is *sus scrofa*; variety, *aper*. It is of a brownish black color; but the young are white or fawn colored, with brown stripes. It is wild in Europe, Asia and Africa, living in forests. *Sus larvatus* is the masked boar.

BOARDMAN, GEORGE DANA, an American clergyman and author, born in Tavoy, British Burma, Aug. 18, 1828; son of the American Baptist missionary of the same name. He was educated in the United States, graduating at Brown University in 1852, and at Newton Theological Institution in 1855. He became pastor at Barnwell, S. C.; Rochester, N. Y., and of the First Baptist Church in Philadelphia. His chief works are "Studies in the Creative Week"; "Studies in the Model Prayer"; "Epiphanies of the Risen Lord"; "Studies in the Mountain Instruction." He died in 1903.

BOARDMAN, RICHARD, an English missionary, born in 1738. He became a member of Wesley's conference in 1763, and volunteered for service in America in 1769. He preached in New York and

caught on the coasts of England. The eyes are very large, and placed far forward; the body is of a carmine color lighter below, and with seven transverse orange bands on the back.

BOAS, FRANZ (bō'az), a German ethnologist, born in Minden, Westphalia, July 9, 1858; studied at Heidelberg, Bonn, and Kiel Universities, in 1877-1882; traveled in the Arctic regions in 1883-1884; was assistant in the Royal Ethnographical Museum in Berlin, and privat docent in geography at the University in 1885-1886; and teacher of anthropology in Clark University, Worcester, Mass., in 1888-1892; Columbia, 1899-1901; curator American Museum Natural History, 1907-1908; President American Anthropological Society, 1910, and N. Y. Academy of Science. He spent much time among various American Indian tribes, and, among other works, has published "Baffin Land" (1885); "The Central Eskimo" (1888); "Indians of British Columbia" (1888-1892); "Mind of Primitive Man" (1911).

BOAT, a small open vessel or water-craft usually moved by oars or rowing. The boats belonging to a ship of war are the launch or long boat, which is the largest, the barge, the pinnace, the yawl, cutters, the jolly boat and the gig. The boats belonging to a merchant vessel are launch or long boat, before mentioned, the skiff, the jolly boat or yawl, the stern boat, the quarter boat and the captain's gig.

BOAT BILL, the English name of *cancroma*, a genus of birds belonging to the sub-family *ardeina*, or true herons, and especially of the *cancroma cochlearia*. The bill looks as if formed by two spoons applied to each other on their concave sides. The *C. cochlearia* is whitish, with the back gray or brown and the belly red; the front is white, behind which is a black cap, changed into a long crest in the adult male. It inhabits the hot and humid parts of South America.

BOAT FLY, the English name of the water bugs of the genus *notonecta*, so called because they swim on their backs, thus presenting the appearance of boats.

BOATSWAIN (bōsn), an officer on board a ship, whose function it is to take charge of the rigging, cables, cordage, anchors, sails, boats, flags, and stores. He must inspect the rigging every morning and keep it in good repair; and must either by himself or by deputy steer the life boat. If on a ship of war he must call the men to their duty by means of a silver whistle given him for the purpose; besides taking into custody those condemned by a court martial, and, either by himself or by deputy, inflict on them the punishment awarded.

BOAZ, a Bethlehemite of means, who took upon himself the duty of providing for Ruth, as the near relation of her dead husband Elimelech. From him Jesus Christ was directly descended.

BOBADILLA, FRANCISCO DE, a Spanish statesman, appointed plenipotentiary concerning the State of Hispaniola, in 1500. Having sent its governor, Columbus, to Spain in chains, he was censured and recalled, but was drowned on the return voyage, in 1502.

BOBBIN, a reel or other similar contrivance for holding thread. It is often a cylindrical piece of wood with a head, on which thread is wound for making lace; or a spool with a head at one or both ends, intended to have thread or yarn wound on it, and used in spinning machinery and in sewing machines.

BOBBIN NET, a machine-made cotton net, originally imitated from the lace made by means of a pillow and bobbins.

BOBOLI (bobō-lē) **GARDENS**, the famous grounds of the Pitti Palace at Florence. They contain many fine statues and the Isoleto fountain, designed by Jean de Bologne.

BOB-O-LINK, BOBLINK, REED BIRD, or RICE BIRD (*dolichonyx oryzivorus* or *icterus acripennis*), a common American bird found from Paraguay to Canada, the only one of its kind, and that difficult to classify. Some place it near the Baltimore bird (*icterus*), others near starlings, but both the characteristics and the character of the bob-o-link exhibit much that is unique. In the male the head, lower surface, and tail are black, while the upper surface is lighter, yellowish white in front, black with yellow streaks behind. The color and the note change with the seasons. The female is much plainer—yellowish brown with darker streaks above, and pale grayish yellow below.

The name—originally Bob Lincoln—is an imitation of the bird's note. In song, the full-throated male bob-o-link is unique, rivaling the lark. The change of the male in color and form at the breeding time is very striking. He becomes black and white more emphatically, so as sometimes to be called the skunk bird, and acquires a broad form and a curious, mincing gait.

The bob-o-link is a bird of passage, spending the winter in the West Indies. In summer it is found as far N. as the banks of the Saskatchewan, in 54° lat., but is most plentiful in the Atlantic States and other eastern parts of the United States, where it is to be seen in every meadow and cornfield. It renders good service by the destruction of insects and their larvae; but in the South, both in April and August, at seed time and harvest, its ravages seriously cripple the rice-growing industry, and destroy about a fourth of the crop. Thousands are killed for the table. On account of their beauty and powers of song, many are caught, caged and sold in the markets.

BOB WHITE, popular name of a small game bird of the United States, given because of its peculiar call. In the Northern States it is known as **QUAIL** (*q. v.*), and in the Southern as **PARTRIDGE** (*q. v.*).

BOCAGE, MANOEL DO (bōk'āzh or bōs'āzh), a Portuguese poet, born in 1766. He is esteemed the most original and most truly national of his country's modern poets. His sonnets are the finest in the language. He died in 1806.

BOCARDO, the old North gate of Oxford, England, occasionally used as a

prison. Here Cranmer was incarcerated, and through it went Ridley and Latimer to meet death by fire in 1555. The term was used generally to denote any prison.

BOCCACCIO, GIOVANNI (bō-kătch'-yō), an Italian novelist and poet, son of a Florentine merchant, was born in 1313, in Certaldo, a small town in the valley of the Elsa, 20 miles from Florence. He spent some years unprofitably in literary pursuits and the study of the canon law, but in the end devoted himself entirely to literature. In 1341 Boccaccio fell in love with Maria, an illegitimate daughter of King Robert of Naples, who returned his passion and is immortalized as Fiammetta in many of his best creations. His first work, a romantic love



GIOVANNI BOCCACCIO

tale in prose, "Filocopo," was written at her command; as was also the "Teseide," the first heroic epic in the Italian language, and the first example of the *ottava rima*. In 1341 he returned to Florence at his father's command, and during a three years' stay produced three important works, "Ameto," "L'amorosa Visione" and "L'amorosa Fiammetta," all of them connected with his mistress in Naples. In 1344 he returned to Naples, where Giovanna, the granddaughter of Robert, who had succeeded to the throne, received him with distinction. Between 1344 and 1350 most of the stories of the "Decameron" were composed at her desire or at that of Fiammetta. This work, on which his fame rests, consists of 100 tales represented to have been related in equal portions in 10 days by a party of ladies and gentlemen at a country house near Florence while the plague was raging in that city.

On the death of his father, Boccaccio returned to Florence, where he was greatly honored. He was sent to Padua to communicate to Petrarch the tidings of his recall from exile and the restoration of his property. From this time an intimate friendship grew up between them. They both contributed greatly to the revival of the study of classical literature. In 1373 he was chosen by the Florentines to occupy the chair which was established for the exposition of Dante's "Divina Commedia." His lectures continued till his death. Among his other works may be mentioned "Filistrato," a narrative poem; "Il Ninfale Fiesolano," a love story; and several Latin works. The first edition of the "Decameron" appeared without date or place, but is believed to have been printed at Florence in 1469 or 1470. The first edition with a date is that of Valdarfer, Venice, 1471; what is, perhaps, the only existing perfect copy of this was sold in London, in 1812, for £2,260. He died in Certaldo, in 1375.

BOCCAGE (bōk-äzh'), **MARIE ANNE FIQUET DU** (*née LE PAGE*), a French poetess, born in Rouen, Oct. 22, 1710. She published a small volume of verse in 1746; next an imitation of Milton, "Paradis Terrestre," in 1748; and, in 1756, her most important work, "La Colombiade." Her letters to her sister, written while traveling through England, Holland and Italy, are her most interesting work. During her lifetime she was excessively bepraised by men so great as Voltaire and Fontenelle; but modern readers cannot help thinking that her beauty must have recommended her verses. She was elected a member of many learned academies, and died Aug. 8, 1802.

BOCHE, a slang term born of the World War and used by the French, and later by others of the Allies, in referring contemptuously to their German enemies. Various explanations have been given of its origin, but the most plausible is that it comes from the French word *caboche*, used familiarly for head, especially a big thick head (slow-pate). It had at times been used by Parisian printers before the war in speaking of their German assistants, because of their reputed slowness of comprehension. The next step was to apply it to Germans in general.

BOCK BEER, a kind of strong beer, the first drawn from the vats in the spring when the winter's brew of lager beer is broached.

BODE, JOHANN ELERT, a German astronomer, born in Hamburg, Jan. 19,

1747; became astronomer of the academy in Berlin, in 1772, and, in 1786, director of the observatory there. He published numerous astronomical works, including "Sternkunde" (3d ed., 1808), and "Uranographia" (2d ed., 1818), and founded the "Astronomische Jahrbücher." He died Nov. 23, 1826. The arithmetical relation subsisting between the distances of the planets from the sun, called after him Bode's law, may be thus stated: Write, in the first instance, a row of fours, and under these place a geometrical series beginning with 3, and increasing by the ratio of 2, putting the 3 under the second 4; and by addition we have the series 4, 7, 10, etc., which gives nearly the relative distances of the planets from the sun.

4	4	4	4	4	4	4	4	4
3	6	12	24	48	96	192	384	
4	7	10	16	28	52	100	196	388

Thus, if 10 be taken as the distance of the earth from the sun, 4 will give that of Mercury, 7 that of Venus, and so forth. The actual relative distances are as follows, making 10 the distance of the earth:

Mercury	Venus	Earth	Mars	Asteroids	Jupiter	Saturn	Uranus	Neptune
3.9	7.2	10	15.2	37.4	52.9	95.4	192	300

Close as is the correspondence between the law and the actual distances, no physical reason has been given to account for it, although there is little room for doubt that such exists. Bode's law is, therefore, in the present state of science, empirical. Kepler was the first to perceive the law, and Bode argued from it that a planet might be found between Mars and Jupiter, to fill up the gap that existed at the time in the series. The discovery of the planetoids has proved the correctness of this prediction.

BODLE, a copper coin formerly current in Scotland, of the value of two pennies Scotch, or the sixth part of an English penny.

BODLEIAN, or BODLEYAN, LIBRARY, a library founded at Oxford, England, by Sir Thomas Bodley, in 1597. The library was opened to the public on Nov. 8, 1602. The first stone of a new building to accommodate it was laid on July 10, 1610. All members of Oxford University who have taken a degree are allowed to read in it, as are literary men of all countries. The Bodleian Library contains about 300,000 volumes and is particularly rich in biblical codices and rabbinical literature.

BODLEY, SIR THOMAS, the founder of the Bodleian Library at Oxford, was born at Exeter, in 1544. He was educated at Geneva and Oxford. He traveled much on the Continent, and was employed in various embassies to Denmark, Germany, France, and Holland. In 1597 he returned home, and dedicated the remainder of his life to the re-establishment and augmentation of the public library at Oxford. He was knighted at the accession of James I. He died in London in 1612.

BODMER, GEORG, a Swiss inventor, born in Zürich, Dec. 6, 1786. He invented the screw and cross wheels; and made valuable improvements in firearms and in various kinds of machinery, particularly in that of wool spinning. He died in Zürich, May 29, 1864.

BODONI, GIAMBATTISTA, an Italian printer, born at Saluzzo in 1740. In 1758 he went to Rome, and was employed in the printing office of the Propaganda. He was afterward at the head of the ducal printing house in Parma, where he produced works of great beauty. His editions of Greek, Latin, and French classics are highly prized. He died at Parma in 1813.

BÖDTCHER, LUDWIG (bet'che), a Danish lyrist, born in Copenhagen, in 1793; spent many years in Italy, and nature and man in Italy equally with nature and man in Denmark are the themes of his finest poems—notably "Bacchus," and the collection called "Poems Old and New." He died in 1874.

BODY, the material framework of man or of any of the inferior animals, including the bones, the several organs, the skin, with hair, nails, and other appendages. The following is a list of the quantities of the various elements found in a human body weighing 154 pounds:

	lbs.	oz.	grs.
Oxygen.....	111	0	0
Hydrogen.....	15	0	0
Carbon.....	20	0	0
Nitrogen.....	3	9	0
Phosphorus.....	1	12	199
Sulphur.....	0	2	217
Calcium.....	2	0	0
Fluorine.....	0	2	0
Chlorine.....	0	2	382
Sodium.....	0	2	116
Iron.....	0	0	100
Potassium.....	0	0	290
Magnesium.....	0	0	12
Silicon.....	0	0	2

The organic, non-metallic, and metallic elements are not found in the body in their pure state, but are mixed together, forming the following compounds, the aggregate of which, as in the preceding table, amounts to 154 pounds:

	lbs.	oz.	grs.
Water.....	111	0	0
Gelatine.....	15	0	0
Fat.....	12	0	0
Albumen.....	4	3	0
Fibrine.....	4	4	0
Phosphate of lime.....	5	13	0
Carbonate of lime.....	1	0	0
Fluoride of calcium.....	0	3	0
Chloride of sodium.....	0	3	376
Chloride of potassium.....	0	0	10
Sulphate of soda.....	0	1	170
Carbonate of soda.....	0	1	72
Phosphate of soda.....	0	0	400
Sulphate of potash.....	0	0	400
Peroxide of iron.....	0	0	150
Phosphate of potash.....	0	0	105
Phosphate of magnesia.....	0	0	75
Silicon.....	0	0	3

BOECE, or **BOYCE** (bois), **HECTOR**, a Scottish historian, born in Dundee about 1465. He studied first at Dundee, and then at the University of Paris, where he became Professor of Philosophy in the College of Montaigu, and made the acquaintance of Erasmus. About 1500 he quitted Paris to assume the principalship of the newly founded university of King's College, Aberdeen. In 1527 appeared the "History of Scotland" in Latin, on which his fame chiefly rests. In 1536 a translation of his history was published, made by John Ballentyne or Bellenden, for James V. He died in 1536.

BOEHMЕ, JAKOB (be'me), a German mystical writer, born in 1575. He was apprenticed to a shoemaker in his 14th year; and 10 years later he was settled at Görlitz as a master tradesman, and married a butcher's daughter of the town. He was much persecuted by the religious authorities, and at his death the rites of the Church were but grudgingly administered to him. He imagined himself favored by divine inspiration. His first work appeared in 1616, and was called "Aurora." It contains his revelations on God, man, and nature. Among his other works are "De tribus Principiis," "De Signatura Rerum," "Mysterium Magnum," etc. His writings all aim at religious edification, but his philosophy is very obscure and often fantastic. A sect, taking their name from Boehme, was formed in England. He died in 1624.

BOEHMERIA, a genus of plants, order *urticaceæ*. From several species valuable fibers are obtained. *B. frutescens*, or *puya*, a plant growing wild in Nepal and Sikkim, is the source of the celebrated pooah fiber, which rivals the best European flax for tenacity. This species attains the height of six or eight feet; but the stem is usually very slender. It is cut down for use when the seed is formed; the bark is then peeled off, dried, boiled with wood ashes, and beaten with mallets, to separate its component fibers.

B. speciosa, the wild rhea, also yields a very strong fiber, which is much used in the East. *B. nivea*, the *tchou ma* of the Chinese, is now known to yield the fiber used in the manufacture of the beautiful fabric called Chinese grass cloth. The most important species, *B. nivea* or *tenacissima*, is best known by the more common name, Ramie.

BOEOTIA (bē-ō'sha), a division of ancient Greece, lying between Attica and Phocis, and bounded E. and W. by the Eubœan Sea and the Corinthian Gulf respectively, had an area of 1,119 square miles. The whole country is surrounded by mountains, on the S. Mts. Cithæron and Parnes, on the W. Mt. Helicon, on the N. Mt. Parnassus and the Opuntian Mountains, which also closed it in on the E. The N. part is drained by the Cephissus, the waters of which form Lake Copais; the S. by the Asopus, which flows into the Eubœan Sea. The inhabitants were of the Æolian race; most of the towns formed a kind of republic, of which Thebes was the chief city. Epaminondas and Pelopidas raised Thebes for a time to the highest rank among Grecian States. The term Boeotian was used by the Athenians as a synonym for dullness, but somewhat unjustly, since Hesiod, Pindar, the poetess Corinna, and Plutarch were Boeotians. Pop. about 70,000, mostly Albanians.

BOERHAAVE, HERMANN (ber-hä'-ve), a Dutch physician, born near Leyden, in 1668. He was educated at the University of Leyden for the Church, but at 22 studied medicine. In 1709 he was appointed Professor of Medicine and Botany. Practical Medicine and Chemistry were afterward assigned to him, and he filled them with the greatest distinction. He became Rector of the University, and was admitted to the French Academy of Sciences, and, in 1730, to the Royal Society of London. He enjoyed a reputation almost unparalleled; his system was generally adopted, and patients went, or wrote, to him from all parts of Europe. His fame rests principally on his "Institutiones Medicæ," published in 1708, translated into all European languages; and "Aphorismi de Cognoscendis et Curandis Morbis." He died in 1738.

BOERS, a Dutch word meaning farmers, and applied to the descendants of the emigrants from Holland who made a settlement at the Cape of Good Hope in 1652. They gradually subdued the wilderness; planted trees; built farm houses and farms; and spread civilization over an ever growing territory. In 1796 the settlement was seized by the British as

a result of war; in 1803 was restored to the Dutch; in 1806 was again occupied by the British, and, in the Congress of Vienna, in 1814, was formally ceded by Holland to Great Britain. This settlement was known as Cape Colony. In 1835-1836 a large majority of the Boers moved to the northward, a part settling in what became the Orange Free State, and the other part in the present colony of Natal. The settlers in Natal remained there till 1843, when Great Britain claimed the territory and took military possession of it. The Boer settlers here then removed farther N. and formed the South African, or, as it was locally known, the Transvaal Republic. See BOER WAR; TRANSVAAL COLONY; SOUTH AFRICA, UNION OF.

BOER WAR, the war waged by Great Britain from October, 1899, to May, 1902, against the two South African republics, Transvaal and Orange Free State. The opening of 1902 saw an attempt on the part of the Boers to negotiate terms of peace; but the British Government still refused to consider the question of the independence of the republics, and the effort accordingly failed. Further fighting took place, and in March a column commanded by Lord Methuen was badly defeated near Klerksdorp, its leader being wounded and taken prisoner. Renewed efforts to procure peace before the approaching coronation of King Edward proved successful; and after a meeting of the principal Boer commanders with Lord Kitchener at Vereeniging, the treaty was signed on May 30, at Pretoria, the Boers agreeing to recognize the King of England as their sovereign on condition that representative government should be granted after a limited period, and that the use of the Dutch language be permitted together with that of English. The Boers still remaining in the field now surrendered to the number of 20,000.

The number of combatants who fought on the English side throughout the campaign including regulars, irregulars, Canadians, Australians and sailors amounted to 450,000, of whom about 250,000 were engaged at the same time during the latter stages of the war. Of these 1,072 officers and 21,000 men were killed, and 3,116 officers and 72,500 men invalided home. On the Boer side some 75,000 took part in the war, though never more than 50,000 were present in the field at any time. Their casualties in killed totalled 3,700 and in prisoners 32,000, of whom 700 died before peace was declared. The net cost of the war to Great Britain is estimated at £250,000,000.

BOËTHUS (bō-ē'thus), a Greek sculptor, born in Chalcedon in the 2d century B. C. He is celebrated for his statues of children. "The Boy with the Swan" was his most famous work. A girl playing with dice and a boy extracting a thorn were subjects of other masterpieces by him.

BOËTIUS, or BOËTHIUS, ANICIUS MANLIUS TORQUATUS SEVERINUS (bō-ē'thius), a Roman didactic poet and statesman, born between 470 and 475. While in prison awaiting execution he composed "Consolation of Philosophy" in prose and verse. He died about 525.

BŒUF (bef) BAYOU, a large bayou of the Mississippi river in Louisiana; flowing between Atchafalaya Bayou and Grand Lake.

BOG, a piece of wet, soft, and spongy ground, where the soil is composed mainly of decaying and decayed vegetable matter. Such ground is valueless for agriculture until reclaimed, but often yields abundance of peat for fuel. Bogs are generally divided into two classes: red bogs, or peat mosses, and black bogs, or mountain mosses. The former class are found in extensive plains frequently running through several counties, such as Chat Moss in Lancashire, and the Bog of Allen in Ireland, the depth varying from 12 to 42 feet. Their texture is light and full of filaments, and is formed by the slow decay of mosses and plants of different kinds. Black bog is formed by a more rapid decomposition of plants. It is heavier and more homogeneous in quality, but is usually found in limited and detached portions, and at high elevations where its reclamation is difficult. In Ireland bogs frequently rest on a calcareous subsoil, which is of great value in reclaiming them. In the reclamation of bog land a permanent system of drainage must be established; the loose and spongy soil must be mixed with a sufficient quantity of mineral matter to give firmness to its texture and fertilize its superabundant humus; proper manures must be provided to facilitate the extraction of nutriment from the new soil, and a rotation of crops adopted suitable for bringing it into permanent condition. The materials best adapted for reclaiming peat are calcareous earths, limestone gravel, shell marl, and shell sand.

BOGARDUS, EVERARDUS, a minister of the Dutch Reformed Church in New Amsterdam, now New York; husband of Anneke Jans. The latter owned a farm of 60 acres, comprising now one

of the most valuable sections of New York City. The Bogardus heirs have for many years endeavored, unsuccessfully, to recover this property, which is held by the corporation of Trinity Church. He died Sept. 27, 1647.

BOG BUTTER, a fatty, spermaceti-like mineral resin found in masses in peat bogs, composed of carbon, oxygen, and hydrogen.

BOGHEAD COAL, a brown cannel coal of Scotland, found at Boghead, near Bathgate, and very valuable for gas and oil making.

BOG IRON ORE, or **BOG ORE**, a variety of limonite. It occurs in a loose and porous state in marshy places, often inclosing wood, leaves, nuts, etc., in a semi-fossilized state; also a variety of limnrite.

BOGOMILIAN, a Slavonic Christian sect, founded in the 12th century by a monk called Basil. He believed that the human body was created not by God, but by a demon whom God had cast from Heaven. Basil was buried alive at Constantinople under the Emperor Alexius Comnenus.

BOGOTÁ, under Spanish rule Santa Fé de Bogotá, in South America, the federal capital of the United States of Colombia. It is situated within the limits of the province of Cundinamarca, on a tableland which, at an elevation of 8,694 feet above the sea, separates the basin of the Magdalena from that of the Orinoco. The tableland has an area of about 400 square miles, and is bounded on all sides by mountains. This extensive plain is very fertile and rich in pasture as in grain. Bogotá is 65 miles from its port, Honda, the head of navigation on the Magdalena. The modern city is well laid out, and has several handsome parks. There are theaters, the National university, a magnificent cathedral, a large and well-equipped library and museum, and other public buildings. The city ranks among the foremost in South America for culture and education. The school system is excellent, and there are about 15,000 pupils in public and private schools. The manufactures of the place include soap, leather, cloth, and articles made from the precious metals. Bogotá was founded in 1538, and in 1598 became the capital of the Spanish Vice-Royalty of New Granada; since 1554 it has been the seat of an archbishop. There is rail connection with other important cities. Pop. (1917) 139,287. The river Bogotá, otherwise called the Funcha, is the

single outlet of the waters of the table-land, which, both from geological features and from aboriginal traditions, appears to have once been a land-locked basin. At the cataract of Tequendama the waters plunge over a precipice 700 feet high, their force having hollowed out a well 130 feet deep in the rock below. Some miles from the fall stands the natural bridge of Icononzo, and the plateau also contains a lake, Guatavita.

BOG PIMPERNEL, a species of pimpernel, *anagallis tenella*. It is found in bogs, and not like its congener, the scarlet pimpernel (*A. arvensis*), in corn-fields. It is a small creeping plant with rose colored flowers.

BOG RUSH, an English book name for *schænus*, a genus of the order *cyperaceæ* (sedges). As now limited it contains only the black bog rush, a plant found on wet moors, and recognizable on account of its dark brown, nay, almost black, heads of flowers. It is also the name of a species of warbler about the size of a wren.

BOG SPAVIN, an encysted tumor filled with gelatinous matter inside the hock of a horse.

BOHEMIA, a former Kingdom of Europe, and, until 1918 a crownland and titular kingdom of Austria; now a part of the republic of Czecho-Slovakia. It is bounded by Bavaria, Saxony, the Prussian province of Silesia, Moravia, and the Archduchy of Austria; area 20,223 square miles; pop. about 7,000,000. The prevailing religion is the Roman Catholic, the country being an archbishopric with three bishoprics. The language of the country is the Czech dialect of the Slavonic in some districts, and in most of the cities German is spoken. Bohemia is surrounded on all sides by mountains, and has many large forests. Its plains are remarkably fertile. The chief rivers are the Elbe and its tributary the Moldau, which is even larger.

Productions.—All sorts of grain are produced in abundance, as also large quantities of potatoes, pulse, sugar beet, flax, hops (the best in Europe), and fruits. Wine is not abundant. The raising of sheep, horses, swine and poultry is carried on to a considerable extent. The mines yield silver, copper, lead, tin, zinc, iron, cobalt, arsenic, uranium, antimony, alum, sulphur, plumbago and coal. There are numerous mineral springs, but little salt. Spinning and weaving of linen, cotton and woolen goods are extensively carried on; manufactures of lace, metal and wood work, machinery, chemical products, beet root sugar, pot-

tery, porcelain, etc., are also largely developed. Large quantities of beer (Pilsener) are exported. Prior to the World War the glassware of Bohemia, which is known all over Europe, employed over 50,000 workers. The trade, partly transit, was extensive, Prague, the capital, being the center of it. The largest towns are Prague, Pilsen, Reichenberg, Budweis, Teplitz, Aussig and Eger. The educational establishments include the Prague University and upward of 5,000 ordinary schools.

Literature.—Bohemia possesses a literature of considerable bulk, including in it also works written in Czech by Moravian and Hungarian writers. The earliest fragment is doubtfully referred to the 10th century, and it was not till after the 13th century that it attained to any development. The most flourishing period of the older literature falls within 1409-1620, John Huss (1369-1415) having initiated a new era, which, however, is more fertile in prose works than in poetry. The following period, up to the beginning of the 19th century, was one of decline, but in recent times there has been a great revival, and in almost all departments Bohemian writers have produced works of merit.

History.—Bohemia was named after a tribe of Gallic origin, the Boii, who were expelled from this region by the Marcomans at the commencement of the Christian era. The latter were in turn obliged to give place to the Germans, and these to the Czechs, a Slavic race, who had established themselves in Bohemia by the middle of the 5th century, and still form the bulk of the population. The country was at first divided into numerous principalities. Christianity was introduced about 900. In 1092 Bohemia was finally recognized as a kingdom under Wratislas II. In 1230 the monarchy, hitherto elective, became hereditary. The monarchs received investiture from the German Emperor, held one of the great offices in the imperial court, and were recognized as among the seven Electors of the Empire. Frequently at strife with its neighbors, Bohemia was successively united and disunited with Hungary, Silesia, Moravia, etc., according to the course of wars and alliances. Ottokar II. (1253-1278) had extended his conquests almost from the Adriatic to the Baltic, when he lost them and his life in contest with Rudolph, the founder of the house of Hapsburg. After the close of the Przemysl dynasty (which had held sway for about six centuries) by the assassination of Ottokar's grandson, Wenceslas III., the house of Luxemburg

succeeded in 1310, and governed Bohemia till 1437, the reign of Charles II. (1346-1378) being especially prosperous. Toward the close of this second dynasty civil wars were excited by the spread of the Hussite movement, the central figure of the struggle being John Ziska, the leader of the Taborites. A temporary union between the moderate Hussites and the Catholics having proved a failure, the Reformed Party elected as king, in 1433, the Protestant noble, George Podibrad. On his death, in 1471, they chose Wladislas, son of Casimir, King of Poland, who also obtained the crown of Hungary. His son Louis lost both crowns with his life in the battle of Mohacz against the Turks, and Ferdinand of Austria became, in 1527, sovereign of both kingdoms. Bohemia then lost its separate existence, being declared a hereditary possession of the house of Austria; and its subsequent history pertains to that of the Austrian Empire. In 1848 an attempt was made to assert its ancient independence against the Austrian dominion; a conflict took place, Prague was bombarded, and the insurrection suppressed. For the later history of Bohemia see CZECHO-SLOVAKIA; AUSTRIA, and WORLD WAR.

BOHEMIAN BRETHREN, a religious society, instituted in Prague, about the middle of the 15th century, originally composed of remnants of the Hussites. In 1453 they settled on the borders of Silesia and Moravia. The Thirty Years' War entirely broke up the societies of the Brethren; but afterward they united again, though persecuted. Their exodus and settlement, in 1722, on the estates of Count Zinzendorf, in Saxony, occasioned the formation of the Herrnhuters. See MORAVIANS.

BOEMOND, or **BOÉMOND**, first sovereign of Antioch, was son of Robert Guiscard, and distinguished himself in the first crusade, in 1096. He besieged and took Antioch, of which he was made Prince by the Crusaders, and established there a little kingdom, which existed nearly 200 years. Besieged by the Saracens, he completely defeated them; but was soon after captured, and remained their prisoner two years. He subsequently visited Europe, married a daughter of the King of France, and got the emperor to acknowledge his title. Died in Italy in 1111. Six princes of his name succeeded him in the sovereignty of Antioch, the last, Bohemond VII., being dethroned in 1288.

BOHOL (bō'hol), one of the Philippine Islands, belonging to the Visayas or

Bisayas group. It has an area of about 1,300 square miles and an estimated population of about 250,000. Sugar cane is grown and the island is reputed rich in gold deposits. The most important town is Tagbilaran, a port on the S. W. coast. The Visayas dialect prevails throughout Bohol.

BOIARDO (bō-yär'dō), **MATTEO MARIA, COUNT OF SCANDIANO**, one of the greater Italian poets, was born in 1434 at Scandiano. He studied at the University of Ferrara, and, in 1462, married the daughter of the Count of Norellara. He lived principally at the court of Ferrara on terms of intimate friendship with Duke Borso and Duke Ercole, by the latter of whom he was employed on important diplomatic missions, and appointed, in 1481, Governor of Modena, and, in 1487, Governor of Reggio. He died at Reggio, in 1494. Boiardo has been called the "Flower of Chivalry." His fame rests on the "Orlando Innamorato" (1486), a long narrative poem in which the romances of the Carlovingian cycle are recast into "ottava rima." Full of rich and graceful fancy, this is the only work in which the spirit of chivalry is found in union with the spirit of the Renaissance. Ariosto adopted Boiardo's characters and magic machinery, and brought his narrative to a close in the "Orlando Furioso." Boiardo's other works comprise various Latin eclogues, a versification of Lucian's "Timon," translations of Herodotus, the "Ass" of Lucian, and the "Golden Ass" of Apuleius.

BOIDÆ, a family of *ophidiæ* (serpents) belonging to the suborder *columbrina*. They have no poison fangs. They have the rudiments of hind limbs. The chief genera are *boa*, *python* and *eryx*.

BOII, a powerful Celtic people who dwelt originally in Transalpine Gaul, part of whom settled in the modern Bohemia, and bequeathed their name to that country.

BOIL, a disease called by medical men *furunculus*. It is a phlegmonous tumor, which rises externally, attended with redness and pain, and sometimes with a violent, burning heat. Ultimately it becomes pointed, breaks, and emits pus. A blind boil is one which does not suppurate.

BOILEAU, NICOLAS (bwä-lō'), a French poet, born at Paris, Nov. 1, 1636. He was educated at Beauvais, and received both a legal and a theological training. In his 21st year, however, he inherited a competence, and decided to

follow a purely literary life. His first work appeared under the name of Despréaux. He published his satirical "Adieux d'un Poète à la Ville de Paris," in 1660, and, in 1663, we find him united with Molière, La Fontaine, and Racine, in the famous "society of four." In 1666 he published a collection of satires from which the royal privilege was for a time withdrawn, through the influence of Chapelain, one of the writers whom he had gibbeted. Boileau, however, soon gained the favor of the king, who awarded him various pensions, and in 1677 appointed him, along with Racine, to the post of royal historiographer. "L'Art Poétique," which contains the exposition of his literary creed, and which was imitated by Pope in the "Essay on Criticism," was published in 1674, along with four cantos of the "Lutrin." Between 1669 and 1677 Boileau published nine epistles, written, like his satires, on the Horatian model. In his last years Boileau retired to Auteuil, where he died March 13, 1711.

BOILER, the name given to a vessel in which steam is generated. In its simplest form, it consists of a close vessel made of metal plate, having apertures for the admission of water and egress of steam, fitted with apparatus for showing the level of the water and the pressure of the steam, and in connection with a furnace. When water is boiled in an open pan, the temperature of the water and of the steam rising from it remains at 212° F., and the tension or pressure of the steam is no more than sufficient to make its way into the atmosphere, being exactly equal to that exerted in all directions by the atmosphere itself—14.7 pounds per square inch. In a close vessel, on the other hand, the temperature and pressure to which we can raise the steam are only limited by the strength of the boiler.

The form of a boiler is determined by two considerations—namely, strength to withstand internal pressure, and efficiency in producing steam. The globular form is that best adapted for strength, and was the earliest to be used. It presents to the fire, however, the minimum area in proportion to its contents, and, therefore, has a minimum efficiency. After spherical boilers, cylindrical ones came into use, at first set on end, and afterward laid on their sides, and, later on, these were furnished with internal cylindrical tubes for furnaces.

Boilers may be classified in several ways—as horizontal and vertical; internally and externally fired; and plain, multitubular and tubulous. Large boil-

ers are almost invariably horizontal, but small vertical boilers are often used. They are employed in steam cranes and other situations where great length would be an inconvenience, and otherwise very frequently when small powers are required, especially for temporary purposes. As the size of a furnace limits the fuel which it can burn, this frequently involves having a much larger grate than could be conveniently arranged inside the boiler, and on this and other accounts boilers are usually externally fired. Under the head of plain boilers come all ordinary cylindrical boilers, with or without internal furnaces, horizontal or vertical. They are the cheapest and simplest which can be made, and, if properly proportioned, possess a considerable evaporative efficiency. When it is necessary, however, to economize fuel, or space, or both, multitubular boilers are frequently used. These derive their name from the fact that in them the flame and gases of combustion are made to pass through a great number of small tubes (surrounded by the water) on their way to the chimney. The steam generating power of a boiler depends greatly on the extent of surface which it presents to the flame, and it is obvious that a great number of small tubes present a much larger surface than one large tube occupying the space of them all. Thus, with the same heating surface, a multitubular boiler will occupy much less space than a plain one, and, at the same time, the efficiency of its surface is found to be greater. It is, however, necessarily more expensive and more liable to get out of order. Tubulous boilers differ from multitubular boilers in not only containing tubes, but consisting of them, and having no large cylinders whatever. Their chief advantages are their great strength, for it is easy to make a metal tube strong enough to withstand pressures far higher than any at present in use; and the peculiarity, that if any accident happens or explosion occurs, it will only be to one tube at a time, and not to an immense boiler shell, and its evil consequences will thus be greatly reduced. For this reason tubulous boilers are often called safety boilers.

Locomotive boilers are always multitubular, for much the same reason as marine boilers. The boiler of a single locomotive often contains 1,500 or 1,800 square feet of heating surface, and occasionally as much as 2,000 square feet.

The principal test of the efficiency of a boiler is the quantity of water (generally expressed either in pounds or gallons), which it will evaporate from and

at a temperature of 212° F., with the consumption of one pound of coal. Of course, this varies very much with the quality of the fuel, but with good pit coal (not dross), a Cornish boiler often evaporates 6 to 8 pounds of water per pound of coal, and a multitubular boiler about 10 or 11 pounds per pound of coal. Good Cornish or Lancashire boilers, however, often attain as great economy as those of any other type. The best rate of combustion on the grate varies with the construction of the boiler, from 10 to 18 or 20 pounds per square foot of grate surface per hour, and much more with forced draft, as in a locomotive.

For all first class work, and work where high pressures are to be used, the common material for boiler construction is mild steel, made by the open hearth process, and having a tenacity of about 28 tons per square inch. Copper is often used in the fire boxes of locomotives, but seldom in any other description of boiler. Brass boiler tubes are sometimes seen, and on account of its better conducting qualities, brass is to be preferred to iron, but its costliness prevents it superseding iron in the great majority of cases.

Every boiler has, to render it complete and workable, a number of fittings or mountings, of which the following are the principal: A glass gauge to show the level of the water inside the boiler, and gauge cocks for the same purpose; a gauge to show the pressure of the steam; a valve for admitting water; a cock at the bottom for emptying or blowing off; a valve for the discharge of the steam; one or two safety valves, weighted so that when the pressure of steam in the boiler reaches a certain height, they open and allow the steam to rush into the air; a door by which a man can get in to clean the boiler, etc.

The Cornish boiler has often two internal flues or tubes, which is a much more advantageous construction. In the Galloway boiler, there are two furnaces, but these join together in one chamber just behind the bridges, and the gases are made to pass through a space considerably narrowed by side pockets projecting inward in order that they may be well mixed. From this point to the back of the boiler there is just one flue, made oval in section, and crossed by a considerable number of vertical taper tubes, which form a direct communication between the water beneath and that above the flue. These tubes both promote circulation and strengthen the flue. A later development of the boiler is the water tube boiler, which is extensively used. In this type one or more drums of water legs connected by tubes of com-

paratively small diameter are used. These are filled with water and the gases from the furnace pass around and between the tubes, heating the water contained in them. An advantage of the water tube boiler is the possibility of making it light, powerful, and compact. It is especially well adapted for forced draught, and steam can be raised quickly. These boilers are the safest against explosions. For these and other reasons they are largely used on war vessels and especially torpedo boats.

The most frequent cause of boiler explosions is the inability of the boiler to resist the regular working pressure. A boiler may be weak through various reasons, and old boilers are likely to be weakened by rust and general decay. See STEAM.

BOILING, in general, the change of a substance from the liquid to the gaseous state which takes place throughout the liquid. The boiling point, in science, is the point of degree of the thermometer at which any liquid boils. The boiling point of any liquid is always the same, if the physical conditions are the same. The boiling point of distilled water under pressure of 760 millimeters is 100° C., or 212° F. A difference of height of about 327 meters lowers the boiling point of water about 1° C., or 597 feet ascent lowers it 1° F. The boiling point of organic compounds is generally higher as the constitution is more complex. In a homologous series the boiling point rises about 19° for every additional CH₂ in normal alcohols, and 22° in the normal fatty acids, as ethylic alcohol, C₂H₅(OH) 78.4°; propyllic alcohol, C₃H₇(OH) 97°; acetic acid, CH₃.CO.OH. 118°; propionic acid, C₂H₅.CO.OH 149.6°. The secondary and tertiary alcohols have lower boiling points than the primary alcohols. The replacement of hydrogen in a hydrocarbon by chlorine, or by a radical, raises the boiling point, as benzene C₆H₆. 82°; chlorobenzene C₆H₅.Cl. 135°, amidobenzene C₆H₅.(NH₂) 182°.

Liquids are not increased in heat after they once begin to boil; a fierce fire only makes them boil more rapidly. The following boiling points have been stated:

	Deg. Fahr.
Mercury.....	662
Sulphuric acid.....	610
Olive oil.....	600
Phosphorus.....	554
Iodine.....	347
Saphtha.....	320
Oil of turpentine.....	314
Water.....	212
Nitric acid.....	210
Alcohol.....	173
Sulphuric ether.....	113
Muriatic ether.....	52

In cookery, an important preliminary rule in boiling rests on the fact that water cannot be heated in an open vessel, or in one with the ordinary fitting lid of a cooking utensil, to a higher point than 212° F. When a vessel, then, has once begun to boil, a stronger fire than is just sufficient to keep it boiling will only evaporate, or waste, the water in steam, but will not cook the food any faster. For boiling fresh meat, 20 minutes is the allowance for each pound. The weather must also be considered; in frosty weather, or with very thick joints, extra 20 minutes should be given. Mutton loses in boiling, in 1 pound, 3½ ounces; beef, in 1 pound, 4 ounces. Meat that has been salted and dried has its outer coat already sealed up; it requires, therefore, to be thoroughly washed, soaked for two hours in cold water, dried, and put to boil in cold water, gradually brought to the boiling point, and kept simmering for a time proportioned to the size of the piece.

Before boiling poultry or fish, it is advisable to rub the outside skin with a cut lemon. This insures a snowy white appearance in the cooked food. Fish should be placed in cold water, in which a tablespoonful of salt and one of vinegar is mixed; should be gradually brought to the boiling point, and simmered carefully, lest the outer part should crack before the thick part is done.

BOIS D'ARC (bwä-dark') (sometimes corrupted into BODOCK), also bow-wood, or osage orange (*maclura aurantiaca*), a tree belonging to the *artocarpaceæ*, sub-order *moraceæ*, is a native of the southern United States. Its large, beautiful, orange-like fruits are scarcely eatable, but its spines make it useful as a hedge plant. Its wood is strong, and hard, and elastic, and hence was used by the Indians in the manufacture of their bows.

BOIS DE BOULOGNE (bwä dé bö-lö'n'), a wood near the gates on the W. of Paris, so named after the suburb Boulogne-sur-Seine. It is one of the pleasantest Parisian holiday promenades and a famous dueling ground.

BOISE, city, capital of the State of Idaho, and county-seat of Ada co.; on the Boise river and the Oregon Short Line railroad; 45 miles S. W. of Idaho City. It occupies the site of a former trading post of the Hudson's Bay Company; is in an agricultural and a rich mining region; and is supplied with pure hot water from a flowing boiling well. It contains the State Capitol, erected in 1885-1887, a penitentiary, United States Assay Office, State Library, National banks, public li-

brary, excellent schools, hospitals, and other public buildings. Its industries include meat packing, stone quarrying, and manufactures of cigars, cement, etc. It is an important wool market. Pop. (1890) 2,311; (1910) 17,358; (1920) 21,393.

BOISE, JAMES ROBINSON, an American educator, born in Blandford, Mass., Jan. 27, 1815; was graduated at Brown University, in 1840; and served there as tutor of Latin and Greek and as Professor of Greek till 1850. In 1862, he became Professor of the Greek Language and Literature in the University of Michigan; in 1868, was called to the same chair in the University of Chicago; and, in 1877, became Professor of New Testament Interpretation in the Baptist Union Theological Seminary. On the establishment of the new University of Chicago, he was made Professor-Emeritus of New Testament Greek. He published several classical text books, including editions with original notes of Xenophon's "Anabasis" and the first six books of Homer's "Iliad," besides "Notes" on the Epistles to the Galatians, Romans, etc. He died in Chicago, Feb. 9, 1895.

BOISGOBEY, FORTUNÉ ABRAHAM DU (bwä-gô-bâ'), a French novelist, born in Granville, Sept. 11, 1821. In 1844-1848 he was paymaster in the army at Algiers, and began to write in 1868, somewhat on the lines of Emile Gaboriau. His novels include "The Scoundrels" (Paris, 1873); "Chevalier Casse-Cou" (1873); "The Mysteries of Modern Paris" (1876); "The Demi-Monde Under the Terror" (1877); "The Old Age of M. Lecoq" (1878); and "The Cold Hand" (1879). He died in February, 1891.

BOIS-LE-DUC (bwä-lé-dük'), a fortified city of North Brabant, Holland, founded by Godfrey of Brabant in 1184, at the point where the Dommel and Aa unite to form the Diest; has manufactures of cloth, hats, cotton goods, etc., and a good trade in grain, its water traffic being equal to that of a considerable maritime port. The cathedral is one of the finest in the Netherlands. Pop. about 35,214. The Duke of York was defeated here by the French in 1794.

BOISSIER, GASTON (bwä-syä), a French biographical and critical writer, born at Nîmes, 1823. He was a member of the Academy, and had won celebrity with "Cicero and His Friends," "Life of Madame de Sévigné," "Archæological Walks in Rome and Naples," and numerous contributions to magazines. He died in Paris, June 10, 1908.

BOITO, ARRIGO (bô-ë-tô), an Italian poet and musician, born at Padua, in 1842. His father was an Italian painter and his mother a Polish lady. His librettos, written for Verdi, Bottesini and others, and his own operas, "Mefistofele"



GASTON BOISSIER

and "Nerone," are of a high order of poetry. In 1877 he published a separate volume of verse.

BOKER, GEORGE HENRY, an American poet and dramatist, born in Philadelphia, Pa., Oct. 6, 1823. He graduated from Princeton in 1842; studied law; and was United States Minister to Turkey in 1871-1875, and to Russia in 1875-1879. His plays include "Calaynos" (1848); "Anne Boleyn" (1850); "Francesca da Rimini;" "The Betrothed;" and "All the World's a Mask." Collected plays and poems (Boston, 1856). Also "Poems of the War" (1864); "Königsmark and other Poems" (1869); "The Book of the Dead" (1882); and "Sonnets" (1886). He died Jan. 2, 1890.

BOKHARA, a khanate of central Asia, formerly vassal to Russia, bounded N. by Russian Turkestan, W. by Khiva and the Transcaspian Territory of Russia, S. by Afghanistan, and E. by Chinese Turkestan; area about 93,000 square miles. The country in the W. is to a great extent occupied by deserts; in the E. are numerous ranges of mountains. Cultivation is mainly confined to the valleys of the

rivers, the chief of which is the Oxus or Amu Daria, forming the southern boundary and running close to the boundary on the W. The climate is warm in summer, but severe in winter; there is very little rain, and artificial irrigation is necessary. Besides cereals, cotton and tobacco are cultivated, and also a good deal of fruit. The total population, about 1,250,000, consists of the Usbek Tartars, who are the ruling race, and to whom the Emir belongs; the Tajiks, who form the majority; Kirghiz, with Turcomans, Arabians, Persians, etc. The only two towns of importance are the capital, Bokhara, and Karshi. The rule of the Emir is theoretically absolute. The manufactures are unimportant, but there is a very considerable caravan trade, cotton, rice, silk and indigo being exported, and woven goods, sugar, iron, etc., being imported. The Russian Transcaspian railway crosses the country and reaches Tashkent.

History.—Bokhara was the ancient Sogdiana or Maracanda; capital, Samarkand; was conquered by the Arabs in the 8th century, by Genghis Khan in 1220, and by Timur in 1370; and was finally seized by the Usbecks in 1505. It has recently suffered much from the advances of the Russians, who, in 1868, compelled the cession of Samarkand and important tracts of territory. Since then the Emir Musaffer-Eddin has sunk more and more into a position of dependency on Russia. After the Russian expedition to Khiva in 1873, an agreement was reached between Russia and Bokhara by which Bokhara received a portion of the territory ceded by Khiva to Russia, while the Russians received various privileges in return. The khanate was largely dominated by Russia until the World War. In 1917 the Emir promised a democratic constitution. Bokhara, the capital, is 8 or 9 miles in circuit, and surrounded by a mud wall. The streets are narrow and the houses poorly built; principal edifices: the palace of the khan, crowning a height near the center of the town and surrounded by a brick wall 70 feet high; and numerous mosques, schools, bazaars, and caravanseries. The trade was formerly large with India, but was later almost completely absorbed by Russia. Pop. about 90,000.

BOLAN PASS, a remarkable and dangerous defile in western Asia, traversing the province of Sarawan, in the N. E. corner of Baluchistan. The pass gradually ascends from the plain a length of 55 miles, rising in its progress at the rate of 90 feet every mile, till it reaches the summit, which is 5,793 feet above the

level of the sea. It is in many places walled in by stupendous rocks, where a few hundred resolute men might hold the passage against an army. The pass was formerly, before its occupancy by the British in 1877, infested by bands of lawless Baluchees.

BOLDREWOOD, ROLF, pseudonym of THOMAS ALEXANDER BROWNE, an Australian author, born in England in 1827. He was a son of Capt. Sylvester J. Browne, a founder of Melbourne, Australia. He was educated in Sidney College, and has written "Ups and Downs: a Story of Australian Life" (London, 1879); "Robbery Under Arms: Life and Adventures in the Bush" (1888); "A Squatter's Dream Story" (1890); and "A Modern Buccaneer" (1894); "The Last Chance" (1905); "A Tale of the Golden West" (1906). He died in 1915.

BOLE, a brownish, yellowish, or reddish colored unctuous clay. It contains more or less oxide of iron, which is the coloring matter in it; there is besides about 24 per cent. of water. Dana ranks it as a variety of halloysite, but considers that some of the specimens belong to other varieties.

BOLERO, a national dance of Spain and Spanish America, usually accompanied with the castanets, and the zither or guitar, and sometimes with the voice. The dance is intended to represent a love story.

BOLETUS, a genus of fungi belonging to the order *hymenomycetæ* or *agaricallæ*. It may be distinguished at a glance from *agaricus*, by having the under surface of the cap or pileus full of pores, in place of its being divided in a radiated manner, as *agaricus* is, into lamallæ or gills. Several species, *boletus edulis*, *B. granulatus* and *B. subtomentosus*, are eatable. Other species are poisonous. They grow on the ground or on the trunks of old trees.

BOLEYN, ANNE (bō'len or bul-ān'), second wife of Henry VIII. of England, eldest daughter of Sir Thomas Boleyn and Elizabeth Howard, daughter of the Duke of Norfolk, born, according to some accounts, in 1507, but more probably about 1501. She attended Mary, sister of Henry, on her marriage with Louis XII., to France, as lady of honor, returning to England about 1523, and becoming lady of honor to Queen Catherine. The king, who soon grew passionately enamored of her, without waiting for the official completion of his divorce from Catherine, married Anne in January, 1533, having previously created her

Marchioness of Pembroke. When her pregnancy revealed the secret, Cranmer declared the first marriage void and the second valid, and Anne was crowned at Westminster with unparalleled splendor. On Sept. 7, 1533, she became the mother of Elizabeth. She was speedily, how-



ANNE BOLEYN

ever, in turn supplanted by her own lady of honor, Jane Seymour. Suspicions of infidelity were alleged against her, and, in 1536, the Queen was brought before a jury of peers on a charge of treason and adultery, and found guilty. She was beheaded May 19, 1536.

BOLIDES, a name given to those meteoric stones or aerolites that explode on coming in contact with the atmosphere.

BOLINGBROKE, HENRY ST. JOHN, VISCOUNT, an English statesman and political writer, born in 1678. He became Secretary of War in 1704; resigned in 1707; but, in 1710, he was again one of the ministry. For the next four years he assisted in governing the country, and by the treaty of Utrecht, in April, 1713, brought the war with France to a close. In 1712 he was created Viscount Bolingbroke; and, in 1714, Queen Anne died. This was a fatal blow to Bolingbroke, who had quarreled with his old friend Harley, the Earl of Oxford, and been commissioned to form a new cabinet. He was compelled to make his escape to France. On the accession of George I., he was impeached by Walpole, at the bar

of the House of Lords. Meanwhile he had entered the service of Charles Stuart, the Pretender, who appointed him his Prime Minister, but who, after his return from Scotland, dismissed him. In 1723 he was permitted to return to England, but he was not readmitted to the House of Lords. This excited his animosity, and he began to write against the ministry, which led to the downfall of Sir Robert Walpole. He resided in France from 1735 until his father's death enabled him to take possession of the family estates at Battersea. Here he passed the remainder of his days, employing his time in writing on non-political subjects. He died in 1751.

BOLINGBROKE, HENRY OF, a Duke of Hereford, afterward HENRY IV. (*q. v.*) of England. He figures in Shakespeare's plays, "Richard II." and "Henry IV."

BOLIVAR, the largest state of Venezuela, South America, comprising that portion of Venezuela which lies S. of the Orinoco and Apure rivers; area, 88,701 square miles; pop. about 70,000.

BOLIVAR, SIMON, an American military officer and statesman (named EL LIBERTADOR, from his having rescued central South America from the Spanish yoke), born in Caracas, July 24, 1783. He descended from a noble and wealthy family, received his university education at Madrid, married and returned to South America. His wife dying, he visited Europe, and then returned to Venezuela, entering the service of the newly founded republic as a Colonel. In June, 1810, he was in London, endeavoring to induce the British cabinet to assist the Independent party against the Royalists and, in the following year, he was acting as Governor of Puerto Cabello, the strongest fortress of Venezuela. In 1821, the Independent troops were successful in the battle of Carabobo, where the Royalists lost upward of 6,000 men, and which decided the cause against Spain. On August 20 of the same year, a Republican Constitution was adopted, and decreed to continue, as then defined, till 1834. Bolivar was chosen President. In 1823 he assisted the Peruvians to obtain their independence, and was declared their liberator, and invested with supreme authority. On Feb. 10, 1825, however, he convoked a Congress, and resigned his dictatorship. He now visited the upper provinces of Peru, which, calling a convention at Chuquisaca, gave the name of Bolivia to their country, in honor of their liberator, and appointed him Perpetual Protector, and to draw up a constitution. On May 25, 1826, he presented his

Bolivian code to the Congress of Bolivia, which was afterward adopted. It was subsequently adopted by the Congress of Lima, where, under its provisions, he himself was elected President for life. He now set out for Colombia. His conduct here was misconstrued, and he was supposed to be assuming the powers of a dictator. In 1829 new disturbances arose, and, in 1830, a convention was called for the purpose of framing a new constitution for Colombia. The proceedings were begun by Bolívar, who once more tendered his resignation. This was his last act which had relation to public affairs. He died at San Pedro, near Santa Marta, Dec. 17, 1830.

BOLIVIA, a republic of South America; bounded on the N. by Peru and Brazil; on the E. by Brazil; on the S. by Paraguay, the Argentine Republic and Chile; and on the W. by Peru and Chile; area, 514,155 square miles; pop. (est.), 2,889,970; capital, formerly Sucre; changed to La Paz in 1900.

Topography.—The country is divided into two very marked regions, the high or Andean in the S. W. portion, and the lowlands of the E. and W., which extend into Paraguay and Brazil. The first of these regions is the highest on the American continent, the Plateau of Oruro having an average height of 13,000 feet. This extremely mountainous district was wholly within the area of Bolivia prior to the treaty of 1884. In this region is Lake Titicaca, having an area of more than 3,200 square miles, and a depth of 120 fathoms; and containing several islands, the largest of which was the home of the founder of the Empire of the Incas. The highest elevation of Bolivia to-day is found in the eastern Cordillera range, from which extend a large number of spurs inclosing some of the richest valleys of the country. The Rio Desaguadero, with a course of 160 miles, connects Lake Titicaca with the salt lake and swamps of Aullagas or Paria, and somewhat to the left lies the Laguna de Coiposa, a basin covered in the dry season with a thick crust of salt. The southern and lower table-land is chiefly a desert, where the mountain streams either sink into the sand, or flood, in the rainy season, what are salt pampas throughout the rest of the year. The eastern edge of the eastern Cordillera is a series of terraces descending to the plain of eastern Bolivia, which in the N. belongs to the Amazon basin; and in the S. to the pampas of the Plata.

Climate and Productions.—Bolivia possesses a remarkable range of climate and productions. The regions with an

elevation of over 11,000 feet are called *punas*, while the *puna brava* is the region of snow and ice, above 13,500 feet. Here the climate is cold and dry but generally healthful. Vegetation is scanty and cultivation is principally confined to potatoes, barley, and coarse grasses. The *cabezeras de valles* are the heads of valleys descending to the lowlands, between 9,500 and 11,000 feet; the *medio yungas*, or deeper valleys, have an altitude ranging from 5,000 to 9,500 feet. The first of these regions has a temperate climate, and produces wheat and maize in large quantities; and in the second, tropical fruits begin to flourish. The *yungas*, or plains under 5,000 feet, have numerous streams, and in fertility and resources surpass most of the countries in South America. Agriculture is still in a backward condition. Wheat, maize, barley, beans, and potatoes are produced for local consumption; coffee is raised chiefly for export; sugar cane is grown for distillation; and rubber, cinchona, and cocoa are important and increasing products. Cattle, sheep, and llamas are extensively bred. Bolivia has a very large mineral wealth in silver, copper, tin, lead, zinc, antimony, bismuth, gold, borax, and salt. Bolivia has about 5,000,000 acres under cultivation. The chief crops are corn, wheat, barley, beans, and potatoes. Rubber is produced in large quantities, over 5,000 tons having been exported in 1915.

Commerce.—The total imports in 1917 amounted to 33,480,825 bolivianos, and the exports to 157,748,050 bolivianos.

Education.—Primary education is free and nominally compulsory, although the law concerning it is not rigidly observed. There are 426 elementary schools, with 3,960 teachers and 51,162 pupils. Secondary instruction is furnished by 21 colleges, 5 private lycées, and 5 clerical institutions with 180 teachers and 2,598 students. For higher education there are 19 institutions with 78 professors and 1,291 pupils. Sucre has a university and at La Paz there is a university, a national observatory, and a war college. The educational budget calls for 2,562,468 bolivianos (a boliviano = 39 cents in United States money).

Finances.—The public debt in 1918 was 67,572,378 bolivianos, of this amount 21,662,436 was internal, 39,808,759 external and 6,101,183 floating. The revenue for 1919 was 31,328,767 bolivianos and the expenditure 28,471,853.

Railways.—Railway mileage in 1918 was 1,689 kilometers and 571 kilometers more were under construction. An international line planned in 1919 between Cochabamba, Bolivia, and Formosa, Argentina, was to have 311 miles of its

length in Argentina and 528 miles in Bolivia. The line will open up rich forest lands for development and is expected to be of great commercial advantage to both countries.

Government.—The constitution (Oct. 28, 1880) vests the executive power in a President, elected by direct popular vote, for a term of four years, and ineligible for re-election at the end of his term of office. The legislative authority rests in a Congress, comprising a Senate of 18 members, elected for six years, and a Chamber of Deputies of 64 members, elected for four years. There are also two Vice-Presidents, and a Ministry divided into the Departments of Foreign Relations and Worship, Finances and Industry, Government and Colonization, Justice and Public Instruction, and War. The suffrage is possessed by all who can read and write. The republic is divided into eight departments and these into provinces and cantons. The Roman Catholic is the recognized religion of the republic, and the exercise of other forms of worship is permitted.

History.—It is believed that the oldest civilized empire on the American continent existed in the Titicaca basin, and that it was disrupted about the 8th century, a portion of the people remaining in the highlands of Bolivia till the 14th century, when they were subdued by the Incas of Cuzco. In 1559 this region was formed into the *audiencia* of Charcas, or upper Peru, which was governed by judges under the direction of the Viceroy of Peru. Charcas was made a province of Buenos Aires in 1776. Under long existing discontent the people revolted in 1809, but the effort for freedom was speedily crushed. The country was frequently invaded by patriotic armies from Buenos Aires and Peru during 1811-1821, but all these movements also failed. Under the direction of SIMON BOLIVAR (*q. v.*), the Spanish troops in Charcas were subdued in 1825. On Aug. 6 of that year, the people declared their independence and adopted the name of Bolivia in honor of their liberator, and made General Sucre their first President. In 1836 a Federal republic was established comprising the states of North Peru, South Peru, and Bolivia; but this confederation was dissolved by a revolution in 1839. The country was agitated by revolutions and internal dissensions for many years. In 1879 Chile declared war against Bolivia. Peru came to the aid of the latter and the Chilians defeated their allied opponents. As a result of this war Bolivia mortgaged to Chile the Littoral Depart-

ment, which has an area of 29,910 square miles and contains the important port of Antofagasta, thus losing her entire sea-coast, and also gave Chile possession of rich mineral fields. In 1898 a dispute arose with Brazil in relation to the possession of the Acre region. This was settled in 1903 by the cession of about 70,000 square miles to Brazil, in return for money indemnity and small territorial compensations elsewhere. The settlement with Peru resulted in a long-standing dispute. Bolivia made the claim that the cession of the coast territory made in 1884 was provisional only. In 1904 a treaty was ratified recognizing the dominion of Chile over the disputed territory, but granting Bolivia free access to the sea with the right of erecting customs houses at designated points.

Bolivia for a time remained neutral during the World War, but on April 13, 1917, the German minister was handed his passport as a result of the sinking of a Bolivian vessel which was sailing in neutral waters.

Jose Gutierrez Guerra was elected president in 1917 for the term ending 1921. On July 11, 1920, a revolution broke out and Gutierrez was compelled to renounce his office. He was sent out of the country and a provisional government with a Junta was established pending a new election.

BOLO, a short, broad, lance-shaped weapon; used by the Filipinos in their operations against the American troops. The blade is about 18 inches in length by nearly 3 inches in breadth at its broadest dimension. It tapers from the middle toward the haft as well as toward the point, making it strongly resemble the ancient short sword. It is not double-edged, however, but tapers from a thick back to an extremely keen edge.

BOLOGNA (bō-lōn'yā), one of the oldest, largest, and richest cities of Italy, capital of the province of same name, in a fertile plain at the foot of the Apennines, between the rivers Reno and Savena. It is the see of an archbishop, and has extensive manufactures of silk goods, velvet, artificial flowers, etc. Among the principal buildings are the Palazzo Comunale, which contains some magnificent halls adorned with statues and paintings; the Palazzo del Podestà; and the Church or Basilica of St. Petronio. Among the hundred other churches, St. Pietro, St. Salvatore, St. Domenico, St. Giovanni in Monte, St. Giacomo, Maggiore, all possess rich treasures of art. The leaning towers, Degli Asinelli and Garisenda, dating from the 12th century, are among the most remarkable ob-

jects in the city; and the market is adorned with the colossal bronze Neptune of Giovanni di Bologna. An arcade of 640 arches leads to the Church of Madonna di St. Lucca, situated at the foot of the Apennines, near Bologna, and the resort of pilgrims from all parts of Italy. Bologna has long been renowned for its university, claiming to have been founded in 1088, and having a library which numbers over 200,000 volumes and 9,000 MSS. The Biblioteca municipale has a library which numbers about 160,000 volumes, with 6,000 MSS. The Church of St. Domenico has a library of 120,000 volumes. The Academy of Fine Arts has a rich collection of paintings by native artists, such as Francia, and the later Bolognese school, of which the Caraccis, Guido Reni, Domenichino, and Albano were the founders. Bologna was founded by the Etruscans under the name of Felsina; became, in 189 B. C., the Roman colony Bononia; was taken by the Longobards about 728 A. D.; passed into the hands of the Franks, and was made a free city by Charlemagne. In the 12th and 13th centuries it was one of the most flourishing of the Italian republics; but the feuds between the different parties of the nobles led to its submission to the papal see in 1513. Several attempts were made to throw off the Papal yoke, one of which, in 1831, was for a time successful. In 1849 the Austrians obtained possession of it. In 1860 it was annexed to the dominions of King Victor Emmanuel. Pop. about 190,000.

BOLOGNESE SCHOOL, an Italian school of painting, founded in the 14th century, probably by Franco. The great master of the school was Francesco Francia, a contemporary of Raphael, celebrated for the purity and serenity of his Madonnas. The Caracci, who painted the frescoes of the Farnese Palace, were the leaders of the later school.

BOLOMETER, a most sensitive electrical instrument invented by Svanberg in 1851 for the measurement of radiant heat.

BOLO PASHA, French traitor, executed at Vincennes, France, April 17, 1918. His real name was Paul Bolo. He lived a shady life in Paris, with no apparent means of support, except a pension received from his brother, Monsignor Bolo, an eminent French prelate. After the war had begun, however, Bolo Pasha suddenly seemed to be in possession of large funds and entered upon an expensive mode of living. He went to America, and, as it was later shown,

was in close relations with Von Bernstorff, the German Ambassador to the United States. The activities of Bolo and his sudden accession to wealth had aroused the suspicions of friends of the Allied cause, both in America and in France, with the result that he was shadowed and ultimately arrested as a traitor. His trial was a sensational one. The evidence was overwhelming and Bolo was condemned to death.

BOLOR TAGH, also **BILAUR**, or **BELUT TAGH**, a mountain range formerly imagined to exist in central Asia between eastern and western Turkestan, as the axis of the continent.

BÖLSCHE, WILHELM, German author, born in Cologne in 1861, author of "Scientific Bases of Poetry" (1887), "Bacillus to Man" (1900).

BOLSENA (ancient **VULSINUM**), a walled town of central Italy, province of Viterbo, 11 miles W. S. W. of Orvieto, on a lake of the same name. It is only noticeable for the ruins of the Etruscan goddess Nortia, a granite sarcophagus, ornamented with *bas reliefs*, and other remains of antiquity. This was anciently a place of great wealth and luxury, and Pliny says that when taken by the Romans, 266 B. C., it contained no less than 7,000 statues.

BOLSHEVISM, a political and economic theory that has received practical application in Russia and to a limited extent in other countries. The word itself is Russian and as applied to a party means "Those who want more or most," i. e., the Extremists or Maximalists, who demand at once a complete overthrow of existing forms and the substitution of a new social order, as contrasted with the Minimalists, who, while demanding extensive reforms, are content to have these come gradually and as an evolution from present conditions. Russia offered the field, and the downfall of the Czar furnished the occasion, for putting the theory in practice. The collapse of the Czaristic régime threw the whole vast empire into a welter of confusion. A contest ensued at once for the possession of power. The conservative element sought to establish a republican form of government, and as a concession to the agrarian element, offered to divide among the peasants the former estates of the Czar and the Church. The more moderate Socialists would have gone further in the matter of distribution, but thought the matter should be left with the Constituent Assembly. The Bolshevik element led by **LENINE** and **TROTZKY** (*q. v.*), declared for the taking of all the land

from their owners by the peasants at once, and urged a similar confiscation by the workmen of the factories in which they were employed. The latter program had at least the merit of courage and sincerity. There was no mincing of terms, no veiling of the issues. Confiscation pure and simple was demanded. And since only the comparatively few were propertied and the millions had nothing, the program of Lenin had a powerful appeal.

The struggle for power by the various groups continued for months. The country was still in the war and that thought was still uppermost in the popular mind. The Provisional Government sought to continue loyal to the Allies, and later, when Kerensky assumed the reins of power, he endeavored to keep up the flagging energies of the people. But all this time an unwearied propaganda was being maintained by the Bolshevik leaders that undermined the morale of the troops at the front and the people in the rear. The one idea of the Bolsheviks was to secure the withdrawal of Russia from the war, in order that they might be able to put their social theories into practice. The steps by which they finally succeeded in doing this are told in detail elsewhere in this work. See RUSSIA and BREST-LITOVSK.

Having dissolved the Constituent Assembly and killed or otherwise silenced their opponents, the development of the Bolshevik program proceeded. A proclamation was issued Nov. 26, proclaiming the abolition of class titles, distinctions, and privileges. The corporate property of nobles, merchants, and citizens must be put in possession of the state. All persons henceforth, no matter what had been their previous station, were to be known as citizens of the "Russian Republic." All church property, lands, money, gold, silver, and precious stones were confiscated. It was forbidden to give religious instruction in the schools. All mines, forests, waters, and landed estates, with their live stock, buildings, and machinery were declared the common property of the people.

That changes so drastic could be carried out without stout resistance on the part of those whose interests were menaced was impossible. There were individual and sectional revolts all over the former empire. But the Bolsheviks, although a minority of the people, knew exactly what they wanted and were prepared to go to any lengths to achieve it. A reign of terror was promptly inaugurated, and excesses were perpetrated before which those of the French Revolution pale into insignificance. Men and

women inimical to the ruling power were executed with barely the pretense of a trial. Women and children were held as hostages for the fidelity of men of their family who were at the time out of the government's reach, and vengeance was visited upon them unsparingly on occasion. Spies were everywhere, and no man dared to speak to his neighbor for fear of being denounced. In many cases, fiendish torture and mutilation were an accompaniment of the killings. The evidence on this point is appalling and irrefutable. Nor is the fact of terrorism denied by Lenin and his associates. It is defended by them as being a necessary incident of all revolutions, while the most revolting phases are either palliated or denied. Peters, himself, the former head of the All-Russian Extraordinary Commission, has admitted that in the one year from November, 1918, to November, 1919, 4,444 executions took place through his order. Lenin, in several of his decrees, admits and justifies the existence of terrorism, which, however, he adds, came to an end on Jan. 22, 1920, the date set by the Soviet Government for the abolition of the death penalty. Any intervention by Allied Governments, he declares, would lead to a return of the policy of blood. Other admissions by official Bolshevik organs and pronouncements by leaders indicate how wide was the sweep of the Red Terror.

The claim of Bolshevism that it is a step forward toward democracy has not been justified by the facts. The essence of democracy is the equality of all men before the law and the right of all to life, liberty, and the pursuit of happiness. Bolshevism in practice has been the exact antithesis of this idea. It has disfranchised and oppressed a large part of the Russian people, and that the most intelligent and progressive part. It has put a premium on ignorance and a penalty on brains. Professional men and business men have been enslaved. The Czar has indeed been dethroned, but a many-headed tyrant, the proletariat, has been enthroned in his place. And even this is only a fictitious rule, for the proletariat itself is mercilessly tyrannized over by Lenin and Trotzky and their associates. No man's house is his castle. There is no such thing as the liberty of the press. Life itself is only held on the tenure of servile, instant, unquestioning obedience to the despots who have replaced the Romanoffs.

Cunning casuistry is used to explain and justify these departures from genuine democratic principles. Thus N. Bukharin, a Bolshevik leader, in a pamphlet on "The Program of the Bolsheviks"

vist Party" elaborates its principles. Since it is the aim of the workmen and peasants to wipe out the bourgeoisie, he states, this class must be denied all great liberties, including the right of suffrage. Admitting the charges of suppression of the press, of arbitrary arrests, of the denial of the right of free assemblage, of violation, assassination, and tyrannical methods, the author draws a distinction between the press of the bourgeoisie and that of the workingmen, between gatherings of friends of the Government and those opposed to it, between strikes of laborers against capitalists and strikes of bourgeois intellectuals against the proletariat. The only question is as to what class is using these weapons and against what class they are directed. The conclusion drawn is that liberty of person, speech, press, and assemblage is the right only of those who favor the existing order and should be denied to those who oppose it. To those who assert that that kind of "liberty" is not worth having, a bullet is the sufficient answer.

An invasion of personal liberty that tended more perhaps than any single previous measure to merge the individual in the mass was the mobilization of labor on military lines in the early part of 1920.

The laborer was not henceforth to own himself, to sell his services to whom he chose in the labor market or to choose his own place of residence. Trotzky was frankness itself in discussing the plan. Under the proposed régime, he admitted, each workman was to be a soldier of labor who could not freely dispose of himself. If an order were given him to move to another position, he would have to obey it. If he disobeyed, he would be a deserter and be punished as such. The masses of workmen were to be moved about, ordered and sent from place to place like soldiers. Compulsion, he declared, had always existed in some form or other; under capitalistic forms of government, men had been driven by the blows of economic necessity and the urge of hunger; under the labor militarization plan, they would simply be sent from factory to factory, not by their own will and consent, but in obedience to a single economic plan.

To explain the matter further and emphasize the necessity of the new policy, Lenin amplified the subject in a letter that he addressed in March to all branches of the Communist party.

The social aspects of the theory have come in for severe criticism, especially the attitude taken by it toward the home. It is alleged that the sacredness of that institution has been profaned, and that

a state of affairs prevails that is essentially the practice of the doctrine of free love. It is but fair to say that the so-called "nationalization of women," which was alleged against the system, has not been sustained by the facts. There seems to be little doubt that in the early days of the Soviet Government, two or three local Soviets promulgated decrees in their districts establishing this revolting perversion, but the experiment was short-lived and has not received the sanction of the ruling authorities. As was pointed out, however, in the United States Senate report previously referred to, a condition exists as to marriage and divorce that destroys the sanctity of the marriage relation and can be made a vehicle of unbounded license. The marriage bond can be severed at the merest whim of either party to the contract and there is no limit to the successive unions that may be contracted. It practically establishes a state of free love.

Bolshevism is the avowed enemy of religion. Atheism is taught to the children. All church property has been confiscated, and the clergy and all others connected with religious institutions have been disfranchised and deprived of the right to occupy public positions. The Sunday school has been suppressed and all teaching of religious doctrines in public, either in schools or institutions of any kind, is expressly forbidden. The recognition of a Supreme Being in judicial oaths has been prohibited. Under the old régime, it was obligatory on every newspaper or periodical printed in Russia, on Easter Sunday, to carry as a headline, "Christ is Risen." On Easter Sunday, 1918, the Bolshevik papers substituted the headline "One Hundred Years Ago To-day, Karl Marx Was Born."

As regards secular education, the Bolsheviks have made some progress in reducing the immense proportion of illiterates among the Russian people. Schools have been established in all parts of the former empire. A decree issued by the Government reads as follows:

"The whole population of the Soviet Republic must be able to read and write. All Russians between the ages of 8 and 50 who are illiterate are bound hereby to learn to read and write in the Russian language or in their original tongue as they please. All literate persons may be called upon to teach the illiterate. The period in which illiteracy is to be abolished shall be fixed by the municipal or provincial Soviet in each district. For adult citizens undergoing instruction in reading and writing, the working day is abridged by two hours during the entire

educational period. Citizens evading duties specified by this decree or in any way interfering with its provisions are subject to trial by the revolutionary tribunal."

Large sums have been devoted by the Bolshevik Government to spreading propaganda with a view to undermining and overthrowing other governments. They have had paid emissaries at work in Sweden, France, Germany, Denmark, Finland, Switzerland, Italy, Great Britain, and the United States, as well as in Brazil and Argentina in South America. In many of these countries the Bolshevik agents, when they could be detected, have been arrested and deported. They have been dangerously near to success in Hungary, where for a time a Communist régime, modeled closely upon its Russian prototype, held control of the Government; in Germany where the Spartacist outbreaks were largely subsidized by Russian funds, and to a lesser degree in other European countries. In the United States their activities were quelled, temporarily at least, by the rounding up and deportation of over two hundred of the most dangerous agitators. The story of their endeavors will be narrated at greater length in the articles bearing on the various countries concerned.

It is in the East, however, that the wide spread of Bolshevik doctrines has caused the greatest uneasiness and alarm. The unrest among Mohammedan populations was seized upon by Lenin and his associates as a lever for provoking revolution in the East, with the view of ultimately reaching India and overturning British rule in that country. Starting among the Mohammedan Tatars of Russia itself, the movement spread rapidly to Turkestan, Afghanistan, and Persia, even infecting the new Republics of Georgia and Azerbaijan, and coming close to the gateway of India. An Afghan mission was sent to Moscow to avow its solidarity with Russia on the principles of Bolshevism. Even in China and Japan Bolshevik emissaries are working with fervor and a degree of success that threaten the peace and security of those governments, unless effective steps are taken to render the efforts fruitless.

BOLTON, or BOLTON-LE-MOORS, an important English manufacturing town and parliamentary and municipal borough in south Lancashire, on the Croal, 11 miles N. W. of Manchester. The river Croal divides the town into Great and Little Bolton. It was celebrated as far back as the time of Henry VIII. for its

cotton and its woolen manufactures. Emigrants from France and the Palatinate of the Rhine subsequently introduced new branches of manufacture; and the improvements in cotton spinning in the middle of the 18th century rapidly increased the trade of the town. It is the birthplace of the daily evening press, "*Bolton Evening News*." During the Civil War the Parliament garrisoned Bolton; in 1644 it was stormed by the Earl of Derby. A canal was opened from Manchester to Bolton in 1791. Pop. about 170,000.

BOLTON ABBEY, a notable English structure in Yorkshire; in a highly picturesque district on the river Wharfe, 6 miles E. of Skipton, and 21 N. W. of Leeds. Founded for Augustinian canons about 1150, it has been celebrated by Wordsworth in "*The White Doe of Rylstone*" and "*The Force of Prayer*."

BOLTON, CHARLES KNOWLES, an American poet and miscellaneous writer, son of Mrs. Sarah Knowles Bolton, born in Ohio, in 1867. He is librarian of the Boston Athenaeum Library. He has written in prose "*Gossiping Guide to Harvard*," "*Saskia, the Wife of Rembrandt*," etc.; in verse "*The Wooing of Martha Pitkin*," "*Love Story of Ursula Wolcott*," etc.

BOLTON, SARAH KNOWLES, an American author, born in Farmington, Conn., Sept. 15, 1841. She married Charles E. Bolton, a merchant and philanthropist. She is the author of a number of books, including "*Girl Who Became Famous*" (1886); "*Famous American Authors*" (1887); "*Famous American Statesmen*" (1888); "*Famous Types of Womanhood*" (1892); etc. She died Feb. 2, 1916.

BOMA, city and capital of the Kongo Free State, on the right bank of the Kongo river, till 1876 was the extreme inland post of the Dutch and Portuguese traders. It contains the establishment of the governor-general and also the local government of the administrative district of the same name.

BOMB, in ordnance, the same as a bomb shell; a hollow iron ball, spheroid, or anything similar, filled with gunpowder, and provided with a timed percussion fuse. It is fired from a mortar or howitzer. Bombs were used at the siege of Naples in 1434. Mortars for throwing bombs were first cast in 1543.

Modern political upheavals have induced a traffic in packages of explosives, which have been christened bombs. These terrific agents of destruction have been used with murderous effect in the

larger European cities: Petrograd, Madrid, and Paris; also in Chicago. The anarchists have regularly established factories for the production of the missiles. The usual method of construction is to fill a hollow sphere with some high explosive together with pieces of scrap iron, nails, bullets, or anything that will wound. The explosives used are generally nitroglycerine, fulminate of mercury, etc. The most deadly of all the agents, however, is a bomb made with chlorate of potash and picric acid.

BOMBA, a title popularly conferred upon King Ferdinand II. of Naples and by which he will be recorded in history. This appellation he received from the violation of his solemn oath to the citizens of Palermo, which city he perfidiously bombarded, in 1849; thus outraging his own plighted word, the laws of humanity, and the constitutional policy he had sworn to observe.

BOMBARDIER BEETLE, a name applied to many coleopterous insects of the tribe *carabidae*. They are divided into two genera—the *brachinus*, and the *aptinus*; the latter has no membranous wings under the wing sheath. Those found near the tropics are large and brilliantly colored, but those found in this country are generally small. They are called bombardier beetles on account of a remarkable property they possess of violently expelling from the anus a pungent acrid fluid, which, if the species be large, has the power of producing discoloration of the skin, similar to that produced by nitric acid. It also changes blue vegetable colors to red, and then to yellow.

BOMBARDMENT, an attack with bombs. Specifically, the act of throwing shells and shot into a town, fort, or ship. Sometimes carcasses, stink pots, rockets, hot shot, and other incendiary missiles are used for this purpose. The bombardment of a town takes more effect upon the civilians than the garrison, as the latter, in any well constructed fortified place, are lodged in bomb proof buildings. Before bombarding a town, it is customary to give notice thereof, to allow women, children, and non-combatants to leave it. Bombs and bombing reached a high point of development during the World War. See EXPLOSIVES; ARTILLERY.

BOMBAX, also known as the silk cotton tree; a genus of plants belonging to the order *sterculiaceæ* (*sterculiads*) and the section *bombacæ*. *B. pentandrum* is the cotton tree of India. The fruit is larger than a swan's egg, and when ripe opens in five parts, display-

ing many roundish, pealike seeds enveloped in dark cotton. This tree yields a gum, given in conjunction with spices in certain stages of bowel complaints. *B. ceiba*, the five-leaved silk cotton tree, rises to a great height. Its native country is South America and the adjacent West India Islands, where its immense trunk is scooped into canoes.

BOMBAY, a presidency and one of the eight great provinces of British India: between lat. 14° and 29° N., and long. 66° and 77° E. It includes Bombay, Tind and Aden. Area, 123,059 square miles. Pop. about 19,672,642, and the native states, area, 63,864 square miles, pop. about 7,411,676. The city of Bombay has a population of about 1,000,000. The southern portions are well supplied with moisture, but a great part of Sind is the most arid portion of India. The climate varies, being unhealthful in the capital, Bombay, and its vicinity, but at other places, such as Poona, very favorable to Europeans. The chief productions of the soil are cotton, rice, millet, wheat, barley, dates, and the cocoa palm. The manufactures are cotton, silk, leather, etc. The great export is cotton. The administration is in the hands of a governor and council. The chief source of revenue is the land, which is largely held on the ryotwar system. Like Bengal and Madras, the presidency has its own army.

BOMBAY, the chief seaport on the W. coast of India, and capital of the presidency of the same name; at the southern extremity of the island of Bombay; is divided into two portions, one known as the Fort, and formerly surrounded with fortifications, on a narrow point of land with the harbor on the E. side and Back Bay on the W.; the other known as the City, a little to the N. W. In the Fort are Bombay Castle, the Government offices, and almost all the merchants' warehouses and offices. Bombay has many handsome buildings, both public and private, as the cathedral, the university, the secretariat, the high court. Various industries, such as dyeing, tanning, and metal working, are carried on, and there are large cotton factories. The commerce is very extensive, exports and imports of merchandise reaching a total value of over \$300,000,000 annually. The harbor is one of the largest and safest in India. There is a large traffic with steam vessels between Bombay and Great Britain, and regular steam communication with China, Australia, Singapore, Mauritius, etc. The island of Bombay, which is about 11 miles long and 3 miles broad, formerly subject to inundations, is pro-

tected by embankments, to prevent which substantial walls have been constructed. After Madras, Bombay is the oldest of the British possessions in the East, having been ceded by the Portuguese in 1661. Pop. about 1,000,000.

BOMBАЗINE, a mixed silk and woolen twilled stuff, the warp consisting of silk and the weft of worsted. Black bombazine has been much in use for mourning garments.

BOMBIDÆ, a family of hymenopterous insects, containing the humble or bumble bees.

BOMB LANCE, a harpoon used in whale fishing which carries a charge of explosive material in its head. In one form of the weapon the arrangement is that when the harpoon strikes the fish, the bar, which is pivoted obliquely in the head of the instrument, shall serve to release a spring acting on the hammer, which then explodes the cap and bursts the charge chamber.

BOMBON, a large, fresh water lake in Luzon, Philippine Islands, about 50 miles S. of Manila. It is 105 square miles in area. There is a small island in the center, from which rises the volcano of Taal, the lowest in the world, its height being only 850 feet. The waters of the lake find an outlet to the sea through the Pansipit river.

BOMBYX, the genus of moths to which the silk worm moth (*B. mori*) belongs.

BONA FIDES, literally, good faith; honesty, as distinguished from *mala fides* (bad faith). The law requires all persons in their transactions to act with good faith; and a contract, when the parties have not acted *bona fide*, is void at the pleasure of the innocent party.

BONAPARTE (pronounced in Italian in four syllables; in French and English in three), the name of a famous family, which was spelt Buonaparte by the Emperor Napoleon and his father till 1796. As the name of Bonaparte occurs in Corsica as early as the 10th century, it is probable that the island may have been their original home. In the 16th century mention is again found of the Bonapartes in Corsica, where in Ajaccio they occupied a respectable position as a patrician or leading family. In the 18th century this family was represented by three male descendants, all residing at Ajaccio; the archdeacon, **LUCIEN BONAPARTE**; his brother, **NAPOLEON BONAPARTE**; and his nephew, **CHARLES**.

CHARLES BONAPARTE, father of the Emperor Napoleon, was born at Ajaccio in 1746; studied law at Pisa; and married, in 1768—without the consent of his uncles—a beautiful young patrician lady, named Letizia Ramolino. In 1768 he removed with his family to Corte, in order to assist General Paoli in defending the island against the French invasion. As the French prevailed, and further resistance was useless, Charles Bonaparte attached himself to the



NAPOLEON BONAPARTE

French interest, and in 1771 was included by Louis XV. in the election of 400 Corsican families to form a nobility. In 1773 Charles Bonaparte was appointed royal counselor and assessor of the town and Province of Ajaccio. In 1777 he was a member of the deputation of Corsican nobles to the Court of France. In this capacity he resided for some time in Paris, where he gained for his son Napoleon, through the interest of Count Marbeuf, a free admission into the military school at Brienne. In 1779 he returned to Corsica, and in 1785 went to Montpellier, dying the same year. By his marriage with Letizia he left eight children: **JOSEPH BONAPARTE**, King of Spain; **NAPOLEON** (*q. v.*), Emperor of the French; **LUCIEN BONAPARTE**, Prince of Canino; **MARIA ANNA** (afterward named **ELISE**), Princess of Lucca and Piombino, wife of Prince Bacciochi; **LOUIS BONAPARTE**, King of Holland;

CARLOTTA (afterward named MARIE PAULINE); PRINCESS BORGHESE ANNUNCIATA (afterward named CAROLINE), wife of General Leclerc, afterward of Murat, King of Naples; JEROME BONAPARTE, King of Westphalia. These members of the Bonaparte family, with the children of BEAUHARNAIS (q. v.), adopted by the Emperor Napoleon when he married Josephine, are distinguished as the *Napoleonicæ* of modern French history. By a decree of the Senate (1804), the right of succession to the throne was restricted to Napoleon and his brothers, Joseph and Louis, with their offspring. Lucien and Jerome were excluded on account of their unequal marriages. As Joseph, the eldest brother of the Emperor, had no son, the descendants of Louis became nearest heirs to the throne.

MARIA LETIZIA RAMOLINO, mother of Napoleon I., lived to see her family placed on the thrones of Europe, and also witnessed their downfall. She was born at Ajaccio in 1750. After the death of her husband, she lived for some time in Corsica, and in 1793, when the island came under British rule, removed with her family to Marseilles, where she lived in poverty, mainly supported by the pension given to Corsican refugees. After her son became First Consul she removed to Paris, and when her son was crowned in 1804 received the title Madame Mère. After the downfall of Napoleon, Letizia lived with her stepbrother, Cardinal Fesch, in winter at Rome, and in summer at Albano, and submitted to her change of fortune with remarkable dignity. She died in 1836.

JOSEPH BONAPARTE, eldest brother of Napoleon, was born at Corte, in Corsica, in 1768. On the death of his father he exerted himself to support the younger members of the family, and in 1793 removed with them to Marseilles, where he prepared for the bar. In 1797 he was elected a member of the Council of Five Hundred, and, in the same year, was sent as Ambassador from the republic to Rome. In 1800, after he had proved his ability in several offices of State, he was chosen by the First Consul as Plenipotentiary to conclude a treaty of friendship with the United States of America. He signed the Treaty of Peace at Luneville, 1801, and that of Amiens, 1802; and, with Cretet and Bernier, conducted the negotiations relative to the *concordat*. After the coronation of Napoleon new honors fell to the share of Joseph Bonaparte, who was made commander-in-chief of the army of Naples; in 1805, ruler of the Two Sicilies; and in 1806, King of Naples. Though, during his

reign, many beneficial changes of government were effected, these reforms were not managed judiciously; and his humane feelings brought him into frequent collision with his imperious brother. He was far too fond of the fine arts to be a vigorous ruler in stormy times. In 1808 Joseph Bonaparte was summarily transferred by his brother to the throne of Spain, and Murat took his place as King of Naples. Joseph was unprepared to cope with the Spanish insurgents, and after the defeat of the French at Vittoria in 1813, he returned to his estate at Morfontaine, in France.

After the battle of Waterloo he accompanied Napoleon to Rochefort, whence they intended to sail separately for North America. In his last interview with Napoleon, Joseph generously offered to give up the vessel hired for his own escape, but meanwhile Napoleon had determined to surrender himself into the hands of the English. Joseph became an American citizen, and lived for some years at Bordentown, N. J., where he employed himself in agriculture. In 1832 he returned to Europe, and he died at Florence in 1844. His wife, JULIA MARIE CLARY, born in 1777, was the daughter of a wealthy citizen of Marseilles, and the sister-in-law of Bernadotte, King of Sweden. She died in Florence in 1845. By her marriage with Joseph Bonaparte she had two daughters.

LUCIEN BONAPARTE, Prince of Canino, and brother of Napoleon, was born at Ajaccio in 1775, and received his education in the college of Autun, the military school at Brienne, and the seminary at Aix. In 1798 he was made a member of the Council of Five Hundred, and formed a party favorable to the views of his brother Napoleon. Shortly before the 18th Brumaire he was elected President of the Council of Five Hundred. During the ferment which followed Napoleon's entrance, Lucien left his seat, mounted his horse, and, riding through the ranks of the assembled troops, called upon them to rescue their general from assassins. Afterward appointed Minister of the Interior. As Ambassador to Madrid (1800) he contrived to gain the confidence of King Charles IV. and his favorite, Godoy, and to undermine the British influence at the Court of Spain. Lucien was a Republican in opinion, and, therefore, opposed to the absolute rule of his brother; and his second marriage to the widow of a stockbroker did not improve their relations. On condition that he would divorce his wife, the crowns of Italy and Spain were offered him; but he refused them, and preferred living in

retirement at his estate of Canino, in the province of Viterbo, where he devoted his time to art and science. Here he enjoyed the friendship of the Pope, who created him Prince of Canino and Musignano; but, having denounced the arrogant and cruel policy of his brother toward the Court of Rome, he was advised to leave the city. In 1810 he took ship for America, but fell into the hands of the English. After the defeat at Waterloo Lucien Bonaparte alone seems to have preserved his presence of mind. He immediately advised his brother to dissolve the Chambers, and assume the place of absolute dictator. After the second ascent of the throne by Louis XVIII., Lucien lived in and near Rome, and died at Viterbo in 1840. He possessed considerable talents and firmness of character.

His eldest son was CHARLES LUCIEN JULES LAURENT BONAPARTE, Prince of Canino and Musignano, born at Paris in 1803. He never exhibited any inclination for political life. He acquired a considerable reputation as a naturalist, and especially as a writer on ornithology. He died in 1857. He was a member of the principal academies of Europe and the United States. His chief publications are a continuation of Wilson's "Ornithology of America," and "Inconografia della Fauna Italica." The second son, PAUL MARIE BONAPARTE, born in 1808, took a part in the Greek War of Liberation, and died by the accidental discharge of a pistol in 1827. The third son, LOUIS LUCIEN BONAPARTE, born in 1813, at Thorngrove, Worcestershire, during his father's imprisonment in England, early devoted himself with equal ardor to chemistry, mineralogy, and the study of languages, and became an authority of the first rank in Basque, Celtic, and comparative philology generally. His election for Corsica in 1848 was annulled, but he was sent to the Constituent Assembly for the Seine department next year, and was made Senator in 1852, with the title of Highness in addition to that of Prince, which he already possessed from his birth. Most of his contributions to linguistic science have been privately printed. Among these are a translation of St. Matthew's version of the parable of the sower into 72 languages and dialects of Europe (1857); a linguistic map of the seven Basque provinces, showing the delimitation of the "Euscaria," and its division into dialects, subdialects, and varieties (1863); a Basque version of the Bible in the Labourdin dialect (1865); a masterly treatise on the Basque verb (1869); besides many papers of profound learn-

ing in the philological journals. A great work produced under his patronage from 1858 to 1860, was a version of the Song of Solomon in 22 different English dialects, besides four in Lowland Scotch, and one in Saxon. He long lived in England, where he was granted a Civil List pension in 1883. He died Nov. 3, 1891. The fourth son, PIERRE NAPOLEON BONAPARTE, born in 1815, passed through many changes of fortune in America, Italy, and Belgium, and returned to France in 1848. In 1870 he shot a journalist, Victor Noir, a deed which created great excitement in Paris; and, being tried, was acquitted of the charge of murder, but condemned to pay \$5,000 to Victor Noir's relatives. He died in 1881. The youngest son, ANTOINE BONAPARTE, born in 1816, fled to the United States after an affair with the Papal troops in 1836, and returned to France in 1848, where he was elected to the National Assembly in 1849; he died in 1877.

LOUIS BONAPARTE, third brother of Napoleon, born in 1778, was educated in the artillery school at Chalons, where he imbibed anti-Republican principles. After rising from one honor to another he was made King of Holland in 1806; but, in fact, was never more than a French Governor of Holland, subordinate to the will of his brother. Yet he seems to have done his best to govern in the interests of his Dutch subjects, and when he found his efforts useless, he resigned in favor of his son in 1810. He returned to Paris in 1814, where he was coldly received by the Emperor. After living for some years in Rome—where he separated from his wife—he removed in 1826 to Florence, where he lived in retirement. He died at Leghorn in 1846. Louis Bonaparte was the writer of several works, "Documents Historiques sur le Gouvernement de la Hollande" (3 vols. London, 1821); "Histoire du Parlement Anglais," (1820); and a critique on M. de Norvins' "History of Napoleon." Louis Bonaparte was married in 1802 to Hortense Beauharnais, daughter of General Beauharnais by his wife, Josephine, afterward Empress of the French.

EUGENIE BEAUHARNAIS, the adopted daughter of Napoleon, Queen of Holland and Countess St. Leu, was born at Paris in 1783. After the execution of her father, she lived for some time in humble circumstances, until Napoleon's marriage with Josephine. In obedience to the plans of her step-father she rejected her intended husband, General Desaix, and married Louis Bonaparte in 1802. She lived mostly apart from her

husband, even as Queen of Holland; and, on the downfall of the Napoleons, passed her time in various countries. She at last settled at Arenenberg, a mansion in the Canton Thurgau, Switzerland. She died at Arenenberg in 1837. She was the author of "La Reine Hortense en Italie, en France, et en Angleterre, pendant l'année 1831," and wrote several excellent songs. She likewise composed the well known "Partant pour la Syrie," which the late Emperor of the French made the national air of France. Of her three sons, the eldest, NAPOLEON LOUIS CHARLES, born 1803, died in childhood in 1807. The second, LOUIS NAPOLEON, born in 1804, Crown Prince of Holland, married his cousin Charlotte, daughter of Joseph Bonaparte, and died in 1831. The third, CHARLES LOUIS NAPOLEON, became Emperor of the French. See NAPOLEON III.

JEROME BONAPARTE, youngest brother of Napoleon, was born in Ajaccio in 1784. After receiving his education in the college of Juilly, he served as naval lieutenant in the expedition to Haiti. When war broke out between France and England in 1803, Jerome was cruising off the West Indies, and was compelled to take refuge in the port of New York. While in the United States he married Elizabeth Patterson (1785-1879), daughter of a merchant in Baltimore. He fought in the war against Prussia, and in 1807 was made King of Westphalia. His administration of his kingdom was careless, extravagant, and burdensome to his subjects. The battle of Leipsic brought the reign of Jerome to a close. He fought by the side of the Emperor at Waterloo. After his brother's abdication he left Paris and visited Switzerland and Austria, but ultimately settled in Florence. At the outbreak of the February Revolution (1848), Jerome Bonaparte was in Paris, where he was appointed Governor of the Invalides, and in 1850 was made a French marshal. He died in 1860.

His marriage with Elizabeth Patterson having been declared null by Napoleon, Jerome was forced, after he had gained the Westphalian crown, to marry Catharine, daughter of King Frederick I. of Württemberg. After the battle of Waterloo, her father wished to annul the marriage; but she declared her resolution to share through life the fortunes of her husband. Jerome Bonaparte left in the United States one son, Jerome Napoleon (1805-1870), by his first marriage, who was a wealthy resident, though he never became a naturalized citizen. He left two sons, (1) JEROME NAPOLEON BONAPARTE, born in Balti-

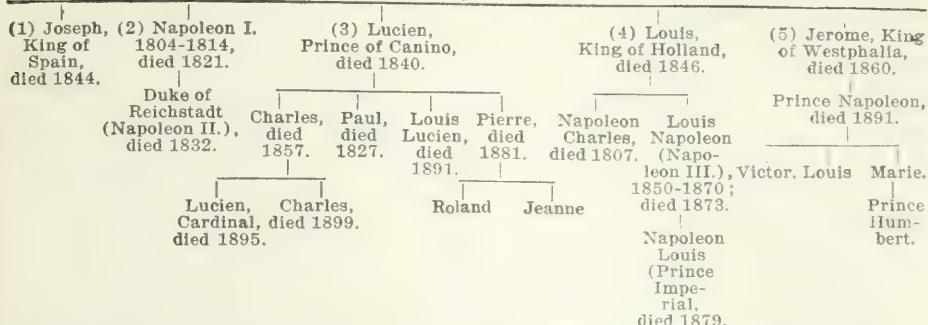
more (1832-1893). He served with credit in the United States and French armies. (2) CHARLES JOSEPH BONAPARTE (*q. v.*), born in Baltimore in 1851; graduated at Harvard, and became a lawyer. By his second wife Jerome Bonaparte had three children. The elder son, JEROME BONAPARTE, born in 1814, died in 1847. MATHILDE BONAPARTE, Princess of Montfort, born at Trieste, 1820, married the Russian Count Anatol Demidoff, and lived at the court of Louis Napoleon. She died Jan. 2, 1904. The younger son, NAPOLEON JOSEPH CHARLES PAUL BONAPARTE, born at Trieste in 1822, passed his youth in Italy; entered the military service of Württemberg in 1837; afterward traveled in several countries of Europe; and was banished from France (1845) on account of his intercourse with the Republican party. After February, 1848, he was elected to the National Assembly. He commanded an infantry division at the battles of Alma and Inkermann. In 1859 he married the Princess Clotilde, daughter of Victor Emmanuel, by whom he had two sons and a daughter. After the fall of the Empire he took up his residence in England, but returned to France in 1872. On the death of the Prince Imperial, son of the Emperor Louis Napoleon, in Zululand in 1879, the eldest son of Prince Napoleon became the heir of the Bonapartist hopes. When, in 1886, the chiefs of the Bourbon family were, by a vote of both chambers, expelled from France, Prince Napoleon and his eldest son were exiled also as pretenders to the throne. He died in 1891. See NAPOLEON.

The Bonaparte Pretenders.—Of the Emperor Napoleon I. and his brothers, Joseph and Louis, male issue is now extinct. The Emperor's brothers, Lucien and Jerome, are represented by the following living descendants:

Prince Victor Napoleon (of the house of Jerome) born July 18, 1862, is the son of the late Prince Napoleon (who died March 18, 1891) and the Princess Clotilde, sister of King Humbert of Italy. The Prince has been recognized by his party as the undisputed head of the Bonaparte family. He lives in Brussels and is unmarried. His only brother, Prince Louis Napoleon, born in 1864, is an officer in the Russian army. His sister, born in 1866, is the widow of Prince Amadeus of Italy, her own uncle, by whom she had a son, Prince Humbert, born in 1889.

The living aunt of Prince Victor Napoleon is the Princess Mathilde, born in 1820, married, in 1840, Prince Demidoff, of Russia; now a widow without children.

THE BONAPARTE FAMILY
Charles Bonaparte



Prince Charles Napoleon, brother of the late Cardinal Bonaparte, who died Feb. 12, 1899, was the last representative of the eldest son of Napoleon's brother, Lucien, in the male line. He was born in 1839; was married and had two daughters—Marie, wife of Lieutenant Giotti, of the Italian army, and Eugénie, unmarried. He had three sisters, married, respectively, to the Marquis of Roccagiovine, Count Primoli, and Prince Gabrilli.

Prince Roland Bonaparte is the only living male cousin of Prince Charles Napoleon. He is a son of the late Prince Pierre Napoleon Bonaparte; was born in 1858; married in 1880, the daughter of Blanc, the proprietor of the Monte Carlo gambling establishment. His wife died in 1882, leaving him a daughter and a fortune. He has one sister, Jeanne, born in 1861, and married to the Marquis de Villeneuve.

BONAPARTE, CHARLES JOSEPH, American jurist; born in Baltimore, June 9, 1851. He is the grandson of Jerome Bonaparte, King of Westphalia; a graduate of Harvard in the class of 1871, and of its law school three years later. Since 1874 he has been engaged in the practice of the law in Baltimore, where he soon became prominent in all movements for reform in the affairs of city, State, and nation. He served as a member of the Board of Indian Commissioners from 1902 to 1904, and was Republican Presidential elector and chairman of the National Civil Service Reform League during the latter year. From 1891 to 1901 he was an overseer of Harvard University. In 1904 he became a trustee of the Catholic University at Washington, and in May, 1905, entered the Cabinet of President Roosevelt as Secretary of the Navy, and was made Attorney-General the following year; serv-

ing until 1909. He was a member of many learned societies, and in 1917 was made a member of advisory board of the Council of National Defense.

BONAR, HORATIUS, a celebrated Scotch hymnist, born in Edinburgh, Dec. 19, 1808; wrote "Hymns of Faith and Hope," many of which have been taken into the hymnals of most of the Protestant Churches. He also wrote more than 20 volumes on theological and religious subjects. He died July 31, 1889.

BONAVVENTURA, ST., an Italian friar of the Order of St. Francis, born in Tuscany in 1221. He was sent by his superiors to Paris, where he, as well as Thomas Aquinas, of the Dominican Order, became involved in contentions with the university, which denied the academical honors to individuals of the mendicant orders. It was not till 1257 that he received his doctor's degree. He had already been elected General of his Order. He retired to the convent of Mt. Alvernia in Tuscany, where he wrote "Vita Santi Francisco," and "Itinerarium mentis in Deum," for which last he received the appellation of the "Seraphic Doctor." He died July 15, 1274, from sheer ascetic exhaustion. Dante, who wrote shortly afterward, places him among the saints of his "Paradiso." In 1482, he was formally canonized by Sixtus IV., and in 1587 was ranked by Sixtus V. as the 6th of the great doctors of the Church.

BONA VISTA, a bay, cape, and town on the E. coast of Newfoundland. The town is a port of entry, and one of the oldest settlements in the island.

BOND, a written acknowledgment or binding of a debt under seal. The person who gives the bond is called the obligor, and he to whom it is given the obligee. A bond is called single when it does not con-

tain a penalty, and an obligation when it does. If two or more persons bind themselves in a bond jointly and severally, the obligee may sue them jointly or single out any one of the number he pleases to sue; but if they are bound jointly, and not severally, he must sue them jointly or not at all. Bonds of an immoral character are void at law.

BOND, in masonry, a stone or brick which is laid with its length across a wall, or extends through the facing course into that behind, so as to bind the facing to the backing. Such stones are known also as binders, bond stone, binding stones, through stones, serpent stones and headers. In brick laying, a bond is a particular mode of disposing bricks in a wall so as to tie and break joint. The English bond has courses of headers alternating with courses of stretchers. In the Flemish bond each course has stretchers and headers alternating.

BONDED WAREHOUSES, places where taxable imports or manufactures may be left in government custody, under bond for payment of the duty, till the importer or manufacturer is prepared to make full payment of duty. The system was designed to promote commerce and certain manufactures by lessening the pressure on the importer or manufacturer by means of instalment payments of duty.

BONDU, or **BONDOU**, a former kingdom of west Africa, in Senegal; now a French protectorate; capital, Bulibani, on the Falem  river. It has a luxuriant vegetation, magnificent forests, and is in many parts under good culture, producing large crops of cotton, millet, maize, indigo, tobacco, etc. The inhabitants are principally the Fulah tribe, and are estimated at about 1,500,000.

BONE, in physiology, a hard, dense, opaque substance used as the internal framework of man, the vertebrata and some cephalopoda, and as the external covering of several classes of animals. It is composed partly of an organic (or animal) and partly of an inorganic (or earthy) material. In a child the earthy material is a trifle under half the weight of the bone, in an adult four-fifths, and in an old person seven-eights. The animal part of bone consists of cartilage, with vessels, medullary membrane and fat. Three hours' boiling will convert it into gelatine. The earthy part consists of phosphate and carbonate of lime, with smaller portions of phosphate and carbonate of magnesia. The outer portion of a bone is in general compact and

strong, the interior reticular, spongy, or cancellated, that is, having spaces or cells (called cancelli) communicating freely with each other. The hard surface of bone is covered by a firm, tough membrane called the periosteum. In the compact tissue are vascular canals called haversian canals. There are in bone pores coalescing into a lacuna beneath. It has blood vessels and nerves. Bones may be classified into long, short, flat, and irregular. A long bone is divided into a shaft and two extremities. There are 198 bones in the fully developed human skeleton.

BONE, in chemistry, consists partly of animal and partly of earthy matter. The former is called ossein. It yields gelatine on being boiled. The composition of human bones, as analyzed by Berzelius, is shown in the following table:

Animal matter soluble by boiling.....	32.17
Vascular substance	1.13
Calcium phosphate, with a little calcium fluoride.....	53.04
Calcium carbonate.....	11.30
Magnesium phosphate	1.16
Soda, with a little common salt.....	1.20
	100

In the other vertebrates the proportions are slightly different.

BONE ASH, ash made of calcined bones. It consists chiefly of tricalcic phosphate $\text{Ca}_2^{''}(\text{PO}_4)_2^{''}$, mixed with about one-fourth its weight of magnesium phosphate and calcic carbonate.

BONE BED, in geology, a bed containing numerous fragments of fossil bones, teeth, etc.

BONE MANURE, one of the most important fertilizers in agriculture. The value of bones as manure arises chiefly from the phosphates and nitrogenous organic matters they contain. Bones have long been used as manure in some parts of England, but only in a rude, unscientific way. It was in 1814 or 1815 that machinery was first used for crushing them in Yorkshire and Lincolnshire, and bone dust and dissolved bones are now largely employed as manures, great quantities of bones being now imported into Great Britain for this purpose. Before being utilized in agriculture they are often boiled for the oil or fat they contain, which is used in the manufacture of soap and lubricants.

BONESET, or **THOROUGHWORT** (*eupatorium perfoliatum*), a useful annual plant, natural order *compositae*, indigenous to the United States, and easily recognized by its tall stem, 4 or 5 feet in height, passing through the middle of a large, double, hairy leaf, and surmounted

by a broad, flat head of light purple flowers. It is much used as a domestic medicine in the form of an infusion, having tonic and diaphoretic properties.

BONGABONG, a town in the S. E. part of Luzon, Philippine Islands, with an estimated population of 25,000. It lies in a mountainous district, and attained military importance as the headquarters of a regiment of United States troops. The town has a municipal government based upon popular election.

BONHAM, a city of Texas, the county-seat of Fannin co. It is on the Texas and Pacific, and the Missouri, Kansas and Texas railroads, and the Red river. The city is the center of an extensive agricultural district and has an important trade in cotton, grain, and live stock. It is the seat of Carlton College. Its industries include flour mills, cotton and cotton seed oil mills, railroad machine shops, planing mills, etc. Pop. (1910) 4,844; (1920) 6,008.

BONHEUR, ROSALIE (*bon-èr'*), commonly called ROSA, a French artist, born in Bordeaux, March 22, 1822. Her studies were directed by her father, himself an artist of ability, and her first two pictures, "Chèvres et Moutons," and "Les Deux Lapins," which were exhibited in



ROSA BONHEUR

1841, attracted much attention. In 1849 a fine work, "Labourages Nivernais," by her, was purchased by the French Government for 3,000 francs and placed in

the Luxembourg collection. In 1855 "The Haymaking Season in Auvergne" was hung at the Universal Exposition in Paris, and in the same year she sent the "Horse Fair" to the French Exhibition in London, where it was the center of attraction for the season. It is now in the Metropolitan Museum in New York. After this work she stood at the very head of delineators of animal life, showing a wonderful power of representing spirited action. She attended horse markets and fairs; generally wearing masculine dress, to study animals. After 1849 she directed the Free School of Design for Young Girls in Paris. During the siege of Paris the Crown Prince of Prussia especially ordered that her studio and residence at Fontainebleau should be spared and respected. She received a first class medal at the French Salon in 1849, and another in 1855; and the decoration of the Legion of Honor in 1865; she was made a member of the Institute of Antwerp in 1868; received the Leopold cross from the King of Belgium in 1880, and from the King of Spain the Commander's Cross of the Royal Order of Isabella the Catholic. In 1892 a celebrated painting by her, entitled "Horses Threshing Corn," was sold for \$60,000. It is the largest animal picture ever painted, showing ten horses large as life. In 1896, on her 74th birthday, she furnished a painting representing the historical combat between two stallions to which Lord Godolphin invited his friends in 1734. She died at Fontainebleau, May 25, 1899.

BONHOMME RICHARD (*bôn-um-rē-shär'*), a famous American warship that, under the command of John Paul Jones, engaged in a terrific battle with the British ship "Serapis" in British waters, off Flamborough Head, on Sept. 23, 1799. Jones lashed the vessels together and compelled the "Serapis" to strike her colors. The "Bonhomme Richard" sank two days afterward.

BONI, a state on the E. coast of the S. W. peninsula of the island of Celebes, in the Pacific Ocean, with an estimated area of 935 square miles. It was formerly the most powerful state in Celebes, but since 1859 has been practically a Dutch dependency. In the N. the scenery is fine, and the soil fertile—rice, sago, and cassia being produced. The inhabitants, called Bugis, have an allied language to the Macassars, with a literature of their own. As enterprising merchants and sailors the Bugis are found in every port of the East Indian Archipelago; they also engage in agriculture and in the manufacture of cotton and

articles of gold and iron, in which they have a large trade. The capital, called Boni, stands on the coast of the S. W. peninsula. The Gulf of Boni separates the S. E. and S. W. peninsulas of Celebes. It is 200 miles long, and 40-80 miles broad. Pop. about 200,000.

BONIFACE I., a Pope, elected after the death of Zozimus, 418, and maintained in the pontifical chair by the Emperor Honorius, against his rival Eulalius. He died in 422.

BONIFACE II. succeeded Felix IV., in 530. He was born at Rome, his father being a Goth. He compelled the bishops in a council to allow him to nominate his successor, and accordingly he named Vigil; but another council disavowed the proceedings of the first. He died in 532.

BONIFACE III. succeeded Sabinianus, in 607, and died a few months after his election; but he obtained from the Emperor Phocas the acknowledgment that the See of Rome was supreme over all other churches.

BONIFACE IV. was the son of a physician, and came to the tiara in 608. He converted the Pantheon into a church. He died in 625.

BONIFACE V. succeeded Adeodatus in 617, and died in 625.

BONIFACE VI. succeeded Formosus in 896, and died 18 days after his election.

BONIFACE VII., whose surname was Francone, assumed the chair after murdering Benedict VI. and John XIV. He was acknowledged sovereign pontiff in 974, and died in 984. His corpse was exposed in the public streets, and trodden under foot.

BONIFACE VIII., in 1294, terrified his predecessor Celestine into a resignation, by denouncing to him, at midnight, eternal damnation if he did not quit the pontifical chair. The credulous Pope, thinking this a supernatural voice, obeyed the command next day, and the crafty cardinal was elected. He commenced his pontificate by imprisoning his predecessor, and laying Denmark under an interdict. He incited the princes of Germany to revolt against Albert of Austria; and also issued a bull, in which he asserted that God had set him over kings and kingdoms. Philip the Fair caused this bull to be burned at Paris; on which Boniface laid France under an interdict. Philip appealed to a general council, and sent his army into Italy, which took Boniface prisoner. The pontiff's be-

havior on this occasion was courageous, for, putting on the tiara, and taking the keys and the crosier in his hands, he said: "I am a Pope, and a Pope I will die." He died at Rome, a few months afterward, in 1303. He wrote several works. His persecuting qualities are alluded to by Dante, in the 27th chapter of the "Inferno."

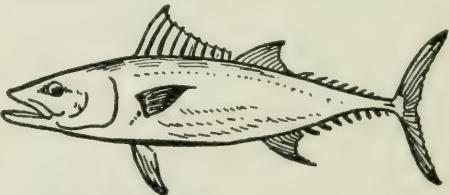
BONIFACE IX. was a Neapolitan by birth, and of a noble family. He was made cardinal in 1381, and Pope in 1389. He died in 1404.

BONIFACE, ST., a saint of the Roman calendar, and a native of England, who was sent by Gregory II. to convert the Germans. Gregory III. made him an archbishop. Born in Devonshire in 680; slain by some peasants in Friesland, in 755. His letters were printed in 1616.

BONIFACIO (bō-nē-fā'chē-ō), **STRAIT OF**, the Fretum Gallicum of the Romans, lies between Corsica and Sardinia. At the narrowest part it is only 7 miles wide. The navigation is difficult owing to the great number of rocks, which, however, are favorable to the production of coral.

BONIN, or (Japanese) **OGASAWARA ISLANDS**, a volcanic group in the Pacific Ocean, 700 miles S. S. E. of Japan, stretching between 26° 30'—27° 45' N. lat., and between 159°—155° E. long. Area, 32 square miles; population about 4,000. Discovered by Quast and Tasman in 1639, they were taken possession of for Great Britain in 1827 by Captain Beechey; but in 1878 the Japanese reasserted their sovereignty, with the view of making them a penal settlement. The harbor is named Port Lloyd.

BONITO, a fish, *thynnus pelamys*. It belongs to the family of *scomberidae* (mackerels), and is nearly allied to the



BONITO

tunny. It is found in the Mediterranean, and is a great foe to the flying fish. The belted bonito is the *pelamys sarda*, and the plain bonito, the *alexis vulgaris*.

BONIVARD, FRANCOIS DE (bō-nē-vär'), a younger son of a family which held large possessions under the House of Savoy, was born about 1496 at Seyssel,

on the Rhone, and in 1513 became prior of St. Victor at Geneva. Falling under the suspicion of the Duke of Savoy, he was taken prisoner by him in 1519. After 20 months' imprisonment he was set free, but in 1530 he was again seized, and taken to the castle of Chillon, Lake of Geneva, where he was imprisoned for six years, the last four in that subterranean vault which the genius of Byron has made famous by his poem. He died in 1570. His chief works are his "Chroniques de Genève" (1551; new ed., 2 vols., 1831), and "De l'Ancienne et Nouvelle Police de Genève" (1555).

BONN, a German town in the Rhenish province of Prussia, beautifully situated on the left bank of the Rhine. It has some trade and manufactures, but is chiefly important for its famous university, founded in 1777 by Elector Maximilian Frederick of Cologne, and for its cathedral, which has a crypt of the 11th century and mediæval wall paintings. Enlarged and amply endowed by the King of Prussia, in 1818, the university is now one of the chief seats of learning in Europe, with a library of more than 300,000 volumes, an anatomical hall, mineralogical and zoological collections, museum of antiquities, a botanical garden, etc. Beethoven was born here. Bonn was long the residence of the Electors of Cologne; in 1794 the French took possession of the town, but it finally passed into the hands of Prussia by the arrangements of the Congress of Vienna, in 1815. Pop. about 88,000.

BONNER, EDMUND, an English prelate of infamous notoriety, was born about 1495, of obscure parentage. He took a doctor's degree at Oxford, in 1525, and, attracting the notice of Cardinal Wolsey, received from him several offices in the church. On the death of Wolsey he acquired the favor of Henry VIII., who made him one of his chaplains, and sent him to Rome to advocate his divorce from Queen Catharine. In 1540 he was consecrated Bishop of London, but on the death of Henry (1547), having refused to take the oath of supremacy, he was deprived of his see and thrown into prison. On the accession of Mary he was restored to his bishopric, and he distinguished himself during this reign by a persecution of the Protestants, 200 of whom he was instrumental in bringing to the stake. After Elizabeth succeeded he remained unmolested until his refusal to take the oath of supremacy, on which he was committed to the Marshalsea (1560), where he remained a prisoner until his death in 1569.

BONNER, ROBERT, an American publisher, born near Londonderry, Ireland, April 28, 1824. He came to the United States in early youth, and learned the trade of a printer. In 1844 he removed to New York, and, in 1851, purchased the "Ledger," then an insignificant paper. By energy and talent he made it remarkably successful, adding to its reputation by securing the contributions of Fanny Fern, Edward Everett, Henry Ward Beecher, and other eminent persons. He became very wealthy, and gratified his taste for fast horses by purchasing the most celebrated trotters in the world. Among them were "Dexter" and "Maud S." He made large gifts of money to Princeton University and was widely known for his many benefactions. He died in New York City, July 6, 1899.

BONNET, a head dress; a dress or covering for the head worn by women; a cap or head covering, much used before the introduction of hats, and still worn by the Scotch Highlanders.

In fortification, the elevation of the parapet about the salient angle of a bastion or ravelin above the general level of the work. The name is also given in permanent defensive works to a little outwork with two faces, forming a salient angle, intended to protect the angle of a ravelin, the faces of which are defended by tenailles or lunettes. An outwork of a similar kind, used in field fortification, having three salient angles instead of one, is called a *bonnet de prêtre*, or priest's bonnet.

In mechanics, a cast iron plate to cover the opening in the valve chamber of a pump; the opening is made so that ready access can be had when the valves need repairing; also a frame work of wire netting over the smoke stack, or chimney, of a steam locomotive, to prevent the escape of sparks; also the cover to the motor of an automobile.

In navigation an additional piece of canvas attached to the foot of a jib, or to a schooner's foresail, by lacings, and taken off in bad weather.

BONNEVAL (bôn-väl'), **CLAUDE ALEXANDRE, COUNT**, a singular adventurer, born in 1675 of an illustrious French family. In the war of the Spanish Succession he obtained a regiment, and distinguished himself by his valor as well as by his excesses. On his return to France he was obliged to fly in consequence of some expressions against the Minister and Madame de Maintenon. Received into the service of Prince Eugene he now fought against his native country, and was raised, in 1716, to the rank

of Lieutenant Field Marshal in the Austrian service, and distinguished himself against the Turks at Peterwardein. But his reckless and impatient spirit brought him into conflict with his superiors, and he took refuge in Constantinople. He was converted to Mohammedanism, named Achmet, was made a pasha of three tails, and, as general of a division of the army, achieved some considerable successes against Russians and Austrians. He died in 1747.

BONNEVILLE, LAKE, a lake that once filled a now desert basin of Utah; at its greatest dimensions had an area of 30,000 square miles, and was 1,000 feet deep.

BONSAL, STEPHEN, an American journalist, born in Baltimore in 1865. He was educated at Concord and Heidelberg. In the Bulgarian-Serbian War he was special correspondent of the New York "Herald," serving in the same capacity in Macedonia and Cuba. He has been Secretary of Legation of the United States in Pekin, Madrid, Tokio, and Korea. He was secretary to the governor of Porto Rico in 1913, and served in various capacities in Mexico and the Philippines in the years following. In 1917 he was appointed a Major in the National Army, and saw service in France. He was intrusted with special missions to Austria and Bohemia in 1919. He has written "The Real Condition of Cuba"; "The Fight for Santiago," etc.

BONTEBOK, the pied antelope *alcelaphus pygarga*), an antelope of South Africa, with white markings on the face, allied to the blesbok.

BONY PIKES, a recent fish, genus *lepidosteus*, of great interest from its being of the order *ganoidae*, of which nearly all the species are extinct. It belongs to the sub-order *holosteiæ*, and the family *lepidosteidæ*. Among other peculiarities the bony pikes have the antique pattern of heterocercal tail, so common in the Old Red Sandstone period. They inhabit the rivers and lakes of temperate and tropical America, some of them growing 3 feet in length, and are used for food. Called also gar pikes.

BONZE, the name given by the Portuguese to any member of the Buddhist priesthood in Japan. Thence the name spread to the priests of the same faith in China and the adjacent regions.

BOOBY, a name for a natatorial bird, the soland (*i. e.*, solent), or channel goose, *sula bassana*. It is of the family *pelicanidæ*. These birds are found, as

their specific Latin name imports, on the Bass rock, in the Frith of Forth, Scotland. They exist also in other places.

BOOK, the general name applied to a printed volume. Printed matter occupies both sides of a certain number of leaves of paper, which are so arranged that, beginning at the upper end of the left side of the first page, one may proceed without dislocation of thought always from left to right till he reach the lower end of the last page. The first page, or *recto*, of the first leaf or folio, is technically known as a bastard or half title page; the next page, or *verso*, of the first folio is left blank. Then follows the title page proper, usually with a blank page at the back. In many books there intervenes a preface or introduction, a dedication, and a table of contents before the main body of the book begins. If any portion of the book has got out of its place, there are two ways by which the true order can be discovered. At the outer corner, or in the center above the reading matter, of each page is a number—1, 2, 3, etc.; this is the pagination or numerical order of pages. At the bottom of certain pages are numbers, 8, 16 and 32 numbers apart, which show the first page of the printed sheet of paper after it has been folded into 8, 16 or 32 pages. A, B, etc., are often used for numerals; and if the book goes beyond the number of letters in the alphabet, the series is continued—AA, BB, etc., or 2A, 2B, etc.

To understand the historic origin of this normal modern book, one must go back to a remote antiquity. The word "book" itself (Saxon *boc*, German, *buch*, Dutch, *boek*) appears originally in Gothic as a plural noun meaning primarily, as is generally believed, the runes inscribed on the bark of separate branches of the beech tree (Saxon, *boc*, German, *buche*, Dutch, *beuke*) for the purposes of divination, etc. *Liber*, the Latin equivalent (which has been adopted by all the Romance and Celtic tongues—French, *livre*, Italian, *libro*, Gaelic *leabhar*, Welsh, *leor*—and is the source of our English word library), properly meant bark, and was applied to prepared papyrus tissue from its barklike appearance. The Greek *biblia*, in like manner, is associated with *byblos*—*i. e.*, papyrus.

As is now well known, the ancient Babylonians and Assyrians had a wide and varied literature. This was preserved in two ways; either painted on the leaves of the papyrus which grew in abundance on the banks of the Euphrates, or impressed on clay shaped into tablets or cylinders. The oldest Egyptian volume still extant (in a sense the oldest

book in the world) is the "Papyrus Prisse," which must be assigned to a very early period of Egyptian history, probably prior to the 12th dynasty—*i. e.*, at least 2000 B. C. Owing to its wonderful adaptability to literary purposes, the prepared papyrus tissue (see PAPYRUS) spread to Greece (at least before the time of Herodotus) and to Rome; and though it was so far supplanted, especially in certain regions, by the finer kinds of prepared skins—the material used by the Jews, Persians, and other Oriental nations—it maintained its position as a book material down to the 10th century A. D. Ali Ibn el Azhad, in 920, describes the different kinds of pen required for writing on paper, parchment, and papyrus (see Dr. Joseph Karabacek's "Das Arabische Papier," Vienna, 1887). The ancient papyrus book, whether Egyptian, Greek or Roman, was got up very much like a modern mounted map. A length of the material, written on one side only, was fastened to a wooden roller, round which it was wound; this formed a *tama* (Egyptian), *kulindros* (Greek), or *volumen* (Latin); hence our volume. Specimens of Egyptian rolls still exist, extending to upward of 20 and even 40 yards; but the great inconvenience attaching to the consulting of such enormous scrolls made it much more usual to break up any lengthy literary production into sections, each on a separate roll. In Egypt the rolls were kept in jars (holding say 9 or 10 each); in Rome in wooden boxes or canisters (often of costly workmanship), or in parchment cases. The change from the rolled to the folded form of book appears to have taken place in the ancient world after the adoption of the parchment or vellum, though practically the same arrangement of successive surfaces had been in vogue in the books or tablets of waxed wood used for notes and letters.

BOOK BINDING, the art of stitching or otherwise fastening together and covering the sheets of paper or similar material composing a book. The edge of a modern book constituted by the margin of the paper composing it is called the binding edge.

When books were literal volumes, or rolls, the way of binding them, if it could, be so called, or at least of keeping them together, was to unroll them from one cylinder and roll each again, as it was perused, on another. When books became separate folios the first method of dealing with them seems to have been the tying them together by a string passed through a hole at the margin of the pile. This is still done in the south of India

and Ceylon with writings on talipot or other palm leaves. The holding together of folios of a literary man's manuscript by a small clasp at one edge is an essentially similar device. The present method of binding seems to have been invented by or under Attalus, King of Pergamus, or his son, Eumenes, about 200 B. C. The oldest bound book known—the binding was ornamental—is the volume of St. Cuthbert, about A. D. 650. Ivory was used for book covers in the 8th century; oak in the 9th. The "Book of Evangelists," on which the English kings took their coronation oath, was bound in oak boards, A. D. 1100. Velvet, silk, hog-skin and leather were used as early as the 15th century; needlework binding began in 1471; vellum, stamped and ornamented, about 1510; leather about the same date, and calf in 1550. Cloth binding superseded the paper known as boards in 1823; india rubber backs were introduced in 1841, tortoise-shell sides in 1856.

The chief processes of bookbinding are the following: Folding the sheets; gathering the consecutive signatures; rolling the packs of folded sheets; sewing, after saw cutting the backs for the cords; rounding the backs and gluing them; edge cutting; binding, securing the book to the sides; covering the sides and back with leather, muslin, or paper, as the case may be; tooling and lettering; and, finally, edge gilding. Books may be full bound, *i. e.*, with the back and sides leather; or half bound, that is, with the back leather and the sides paper or cloth.

Bookbinding may be divided into two classes—viz., case binding or cloth work, and leather or bound work. The former was introduced by Pickering, the publisher, and Leighton, the binder, in 1822. Before that time books were issued by the publishers bound in millboards covered with colored paper. In both France and Germany most books, even the finest, are originally issued in paper covers; whereas, in England, the whole edition often appears in cloth binding.

BOOKKEEPING, the art of keeping books in which pecuniary transactions are so unremittingly and so accurately entered that one is able at any time to ascertain the exact state of his financial affairs, or of any portion of them, with clearness and expedition. The art, in a certain undeveloped state, must have existed from immemorial antiquity, but it received such improvement and impulse at Venice as to make that comparatively modern city to be considered its birthplace. The first known writer on bookkeeping was Lucas di Borgo, who

published a treatise on the subject in Italian in 1495. It is generally divided into bookkeeping by single and bookkeeping by double entry. Bookkeeping by single entry is imperfect, and is scarcely fitted even for very limited establishments. Bookkeeping by double entry being first practiced in Venice, Genoa, and the adjacent towns, is often called the Italian method. In bookkeeping by double entry all transactions inward fall under four heads: cash, bills, book debts, and stock. There are, moreover, a cash book, a bill book, a book for book debts—called the ledger—and a book for the record of stock, that is, stock on hand. There are various other books in a large establishment.

BOOK OF COMMON PRAYER, the book that forms the liturgy of the Church of England. It is a development from the "Breviary Missal" and "Manual" compiled in the 11th century by Osmund, Bishop of Salisbury. A revision of the "Breviary" was made in 1516, by order of Cardinal Wolsey, and it was again revised in 1531, and the "Missal" in 1533. In 1542 a Committee of Convocation was appointed whose work, a litany, in English, was issued in 1544. In 1547 Cranmer's rendering of the "Missal" into English appeared as the "Order of Communion." In 1548 the first version of the present "Book of Common Prayer" was reported to the convocation and adopted by Parliament, as a part of the Act of Uniformity of 1548-1549. A second revision was sanctioned by Parliament in 1552. This was repealed by Queen Mary, and restored by Elizabeth, with changes in 1559. The Puritans suppressed the book, but it was restored at the Restoration. The Savoy Conference of 1661 modified it by concession to the Puritans. It was adopted in Ireland in 1662 and has since been used by the Anglican Church, in its various branches. It consists of various tables, Morning and Evening Prayers, the Litany, Prayers and Thanksgivings, Collects, Epistles and Gospels chosen in accordance with the Church calendar, Order of Communion and other special services, as Matrimony, and Burial of the Dead, the Catechism, the Psalter services connected with the imposition of the clerical and lay offices, and Articles of Religion. The "Prayer Book" of the Protestant Episcopal Church of the United States is a revision of the Anglican book, authorized in 1789, and revised again, 1886-1893.

BOOK OF MARTYRS, a history of the persecution of Reformers in England, by John Fox.

BOOK OF MORMON, a book forming the authoritative scriptures of the members of the Church of Jesus Christ of Latter-Day Saints. Joseph Smith, an American, of Manchester, N. Y., professed to have heard in 1823 the Angel Moroni reveal to him in visions that the Bible of the Western Continent was buried in a box near his residence. This, according to his own account, he at length found—a volume six inches thick, with leaves of thin gold plate, eight inches long by seven broad, bound together with three gold rings; on which leaves was a mystic writing that he characterized as reformed Egyptian. With the book he professed to have found a pair of magic spectacles, by means of which he was able to read the contents which he dictated to an amanuensis. This book consists of an alleged history of America from 600 B. C., when Lehi and his family (descended from the dispersion after the building of the Babel tower) landed in Chile. Between the descendants of Nephi, Lehi's youngest son, and the offspring of his older brothers, who are the North American Indians, long conflicts were waged; the Nephites finally being almost annihilated. There remained a fragment, among whom were Mormon and his son, Moroni. They collected the records of their people, and buried them in the hill of Cumorah, on the Divine assurance that they would be found by the Lord's prophet. Besides this history, the book, as it finally was received, has various moral and religious teachings. The real history of it is as follows: Solomon Spalding, an eccentric preacher, wrote a historical romance in 1812, which a compositor, into whose hands it fell, sold to Smith. This was, for substance, the "Book of Mormon" which Smith issued, to which various additions have since been made.

BOOK OF THE DEAD, a compilation of the religious literature of Egypt in 106 chapters. According to Sayce's "Ancient Empires of the East" (1884), it is a collection of inscriptions from the mummy cases, tombs, and demotic writings—the funeral ritual of the Egyptians, setting forth, in mystical language, the adventures of the soul after death and the means of escaping torment.

BOOKPLATE, an English name for labels of ownership frequently placed on the inside covers of books. The use of bookplates is of some antiquity, and mention has been made of one dated in the middle of the 15th century, but at present the fine bookplates of Bilibaldus Pirckheimer (1470-1530), designed by Albert Dürer, hold the foremost place in

point of time. Engraved English bookplates are not found of so early a date, but an old folio volume from Henry VIII.'s library, now in the British Museum, contains an elaborately emblazoned drawing which formed the bookplate of Cardinal Wolsey, with his arms, supporters, and cardinal's hat. The earliest English engraved bookplate at present known is that of Sir Nicholas Bacon, father of Lord Chancellor Bacon, which is dated 1574. Samuel Pepys had several bookplates; those with his own portrait could not have been engraved before 1685, because he is described therein as Secretary to the Admiralty under Charles II. and James II., but the one with his initials and the crossed anchors was probably engraved as early as 1668.

The styles of design adopted by book collectors for their bookplates have been very diverse. Some of these labels have contained merely the name of the possessor, but the majority are armorial, some are allegorical in design, and others are ornamented with miniature landscapes. Many distinguished artists have condescended to produce bookplates. The name of Albert Dürer has already been mentioned as the designer of Pirckheimer's two plates—one in which the allegorical and the armorial elements are united, and the other consisting of a large and bold portrait of the once celebrated senator of Nuremberg. Of English engravers, William Marshall and Robert White may be especially mentioned. Hogarth engraved a bookplate for John Holland, heraldic artist, and another for George Lambert, the scene painter. The earliest bookplates were of large size, as if made especially for folios, but a smaller size soon became general, a size which was used for both large and small books. The fashion of collecting bookplates is a very modern one.

BOOKWORM, any grub which feeds on the paper of books. The name more especially belongs to the larva of an anobium (*anobium pertinax*, *A. eruditum*, etc.), a small coleopterous insect, which is classed among the Death-watch insects; though the larva of *aeophora pseudospicella*, a small brown moth, seems to have nearly an equal claim to it. The latter much resembles the anobium, save that it has six legs, while the anobium has none. Most people are familiar with the bookworm's ravages; but the creatures are extremely rare in the United States, especially since so many chemical substances have been introduced into the manufacture of paper. In southern Europe, the book-eating anobium is still common.

BOOMERANG, a missile weapon invented and used by the native Australians, who are generally deemed the lowest in intelligence of any tribe or race of mankind. It is a curved stick, round on one side and flat on the other, about three feet long, two inches wide, and three-quarters of an inch thick. It is grasped at one end and thrown sicklewise, either upward into the air, or downward so as to strike the ground at some distance from the thrower. In the first case it flies with a rotary motion, as its shape would indicate, and after ascending to a great height in the air, it suddenly returns in an elliptical orbit to a spot near its starting point. On throwing it downward to the ground, it rebounds in a straight line, pursuing a ricochet motion until it strikes the object at which it is thrown. The most singular curve described by it is when it is projected upward at an angle about 45° , when its flight is always backward, and the native who throws it stands with his back to the object he intends to hit.

BOONE, city and county-seat of Boone co., Ia.; on the Chicago and Northwestern, the Chicago, Milwaukee and St. Paul and other railroads; 36 miles N. N. W. of Des Moines, the State capital. It is an important milling, manufacturing, and coal mining center, and in the vicinity are large deposits of fire and pottery clays. The chief industries are the manufacture of flour, brick and tile, and pottery, and the mining and shipping of coal. Pop. (1910) 10,347; (1920) 12,451.

BOONE, DANIEL, the pioneer of Kentucky, born in Bucks co., Pa., Feb. 11, 1735. He was a Colonel in the United States service, and signalized himself by his many daring exploits against the Indians, and also by his extensive surveys and explorations of the State of Kentucky. In 1793 he removed to upper Louisiana, then belonging to the Spaniards, and was appointed by them commandant of a district there. He was one of the most successful of the enterprising American pioneers of the 18th century, and may be said to have explored, and aided in the settlement of the country from the Allegheny Mountains to the frontier of Missouri. Many places have been named in his honor. He died in Missouri, Sept. 26, 1820.

BOONTON, a city of New Jersey in Morris co. It is on the Lackawanna railroad and the Rockaway river and the Morris canal. Its beautiful situation has made it a favorite residential town. It

has important industries, including the manufacture of storage batteries, hats, bronze, silk, and rubber. The town has



DANIEL BOONE

a public library, an opera house, and other public buildings. Pop. (1910) 4,930; (1920) 5,372.

BOORO, one of the Molucca Islands in the Indian Archipelago, W. of Ceram and Amboyna, belonging to the Dutch. It is oval in shape, 92 miles long and 70 broad. Though mountainous and thickly covered with wood, it is productive, yielding rice, dye woods, etc. Pop. about 15,000.

BOOROOJIRD, a town, Persia, province of Irak-ajemi, in a fertile and well cultivated valley. Pop. about 25,000.

BOOT, an article of dress, generally of leather, covering the foot and extending to a greater or less distance up the leg. Hence the name was given to an instrument of torture made of iron, or a combination of iron and wood, fastened on to the leg, between which and the boot wedges were introduced and driven in by repeated blows of a mallet, with such violence as to crush both muscles and bones. The special object of this form of torture was to extort a confession of guilt from an accused person. See also **BOOTS AND SHOES**.

BOOTES (bō-e'tēs), in astronomy, a constellation called also *Arctophylax*, or

the Bear Driver. It is situated between Corona Borealis on the E., and Cor Caroli, or the Greyhounds, on the W. It contains 54 stars, including 1 of the first magnitude, Arcturus, 7 of the third, and 10 of the fourth. Its mean declination is 20° N., and its mean right ascension is 212°; its center is, therefore, on the meridian on June 9.

BOOTH, AGNES (MRS. JOHN B. SHOEFFEL), an American actress, born in Sydney, Australia, in 1846. She made her first American appearance in New York in 1865, becoming later Edwin Forrest's leading lady. She assumed numerous famous rôles with success. She died Jan. 2, 1910.

BOOTH, BALLINGTON, General of the Volunteers of America, born in Brig-house, England, July 28, 1859. He is a son of Gen. William Booth, founder of the Salvation Army, with which body he was officially connected until 1896, when he seceded and founded the Volunteers, a religious military body organized in the interest of the unchurched masses. He has been repeatedly appointed General-in-Chief of the organization. Is the author of many well known hymns. His wife, MAUDE, ably seconded her husband's efforts, and was very popular on the lecture platform.

BOOTH, EDWIN THOMAS, an American actor, born near Belair, Md., Nov 13, 1833; the fourth son of JUNIUS BRUTUS BOOTH (*q. v.*). When 16 years of age, he made his first appearance on the stage, in the part of Tressel, his father acting as Richard III. Two years later he himself successfully assumed the part of Richard in place of his father, who unexpectedly refused to fulfill an evening's engagement. The following year the two went to California, where the son remained for several years, visiting Australia meanwhile. Meeting with little pecuniary success, in 1856, he returned to the Atlantic States, and from that time forward was recognized as a leading member of his profession. He visited England (1861-1862), and in 1864 produced "Hamlet" at New York for 100 nights consecutively. In 1869 he opened a splendid theater in New York, whose building cost over \$1,000,000, but which involved him in pecuniary ruin. He revisited California in 1876, and in the spring of 1877 was able to settle with his creditors, having earned during the season over \$600,000. Booth visited Great Britain and Germany in 1880-1882, and was everywhere received with enthusiasm. He died in New York, June 7, 1893.

BOOTH, JOHN WILKES, an American actor, born in Harford county, Md., in 1838; another son of JUNIUS BRUTUS BOOTH. He sided with the Confederates in the Civil War, and to avenge the defeat of their cause he formed a con-



EDWIN BOOTH

spiracy against the life of President Lincoln. He mortally wounded the President, while the latter was attending a performance in Ford's Theater, in Washington, on April 14, 1865; broke his own leg in escaping from the building; and concealed himself in Virginia till the 26th, when, on being discovered, and refusing to surrender, he was shot.

BOOTH, JUNIUS BRUTUS, an Anglo-American tragedian, born in the parish of St. Pancras, London, May 1, 1796. He received a classical education but early manifested a predilection for the stage, and when 17 years of age appeared in some unimportant parts. Subsequently he played Richard III., at Covent Garden, a part in which he suddenly became famous. In 1821 he went to the United States, where for the ensuing 30 years he followed his profession with much success. He died suddenly on board a Mississippi river steamer, Nov. 12, 1852.

BOOTH, WILLIAM, founder and General of the Salvation Army, was born at Nottingham, England, April 10, 1829,

was educated there, and from 1850 to 1861, acted as minister of the Methodist New Connection. From the first he was zealous in holding evangelistic services, but the new departure which led to the creation of the Salvation Army on military lines began in 1865 with mission work among the lower classes in the East End of London. Since 1878 Booth's movement has been known as the Salvation Army, of which he continued to be the mainspring and controlling power, directing its movements at home and abroad from his headquarters in London. His enthusiasm and wonderful organizing power gave life to the religious military system, of which he is really "general." His wife was associated with him in the publication of several hymns and religious works dealing with the movement, till her death in 1890. Mr. Booth died in London, Aug. 20, 1912.

BOOTHIA FELIX, a peninsula on the N. coast of North America, in which is the most northern part of the continent, Murchison Point, $73^{\circ} 54'$ N. lat. It is joined to the mainland by Boothia Isthmus, is bounded on the N. by Bellot Strait, and to the E. is separated from Cockburn Island by Boothia Gulf, a southward continuation of Prince Regent's Inlet. It was discovered by Sir John Ross (1829-1833), and named after Sir Felix Booth, who had furnished \$85,000 for the expedition. Here, on the W. coast, near Cape Adelaide, Ross discovered the magnetic pole, $70^{\circ} 5' 17''$ N. lat., and $96^{\circ} 46' 45''$ W. long.

BOOTON, or **BOUTON**, an island of the Malay Archipelago, separated by a narrow strait from the S. E. ray of Celebes, and from the island of Morna. Area, 1,700 miles. It is high, but not mountainous, and thickly wooded, produces fine timber, rice, maize, sago, etc. The people are Malays. The Sultan, who resides at Bolio, is in allegiance to the Dutch, an under-resident being stationed on the island. Pop. about 17,000.

BOOTS AND SHOES, foot coverings of the human family; exceedingly varied in form, and not less diverse in the material out of which they are made.

The sandal is the most ancient foot covering of which we have any record, and examples of very ancient manufacture, taken from Egyptian mummies, are preserved in public collections. The shoe frequently referred to in the Old Testament, and which played an important part in buying and selling, and in other social usages, was a sandal. The common sandal of the ancient Egyptians consisted of strips of papyrus plaited into a kind

of mat, and that form remains the type of sandal of plaited grass or straw worn to this day by multitudes in central Asia, India, China and Japan. The sandal was the ordinary shoe of the ancient Greeks. In Greece, shoes were used only in exceptional circumstances, and long boots lacing up the front were worn by hunters. Sandals (*soleæ*) were the everyday wear of the Roman populace; the patricians wore shoes (*calcei*) of black leather; red leather shoes were reserved for the senators; and the long boot or buskin (*coturnus*), reaching, sometimes, to near the knee, and frequently supplied with a thick sole to add to the apparent stature of its wearer, was appropriated to tragedians and hunters. Sandals and slippers continue to this day to be the staple footgear of Oriental communities.

In mediæval times, shoes with long, pointed toes were worn by the high born; and toward the end of the 14th century these points became ridiculously elongated, so that there appeared to be a long strap projecting from each foot. Different kinds of half boots were worn by the Anglo-Saxons and Anglo-Normans; and in the reign of Edward IV., if not earlier, the boot proper, with tops and spurs, was established as an article of knightly dress. In the reign of Charles I., a species of boot, exceedingly wide at the top, made of Spanish leather, came into use; and with Charles II. the highly decorated French boot was introduced as an article of gay courtly attire. Meanwhile, the jack-boot, as it is called, had become indispensable in the costume of cavalry soldiers and horsemen generally; and by William III. and his followers it was regularly naturalized in England. This huge species of boot remained in use in British cavalry regiments until comparatively recent times, and, in a somewhat polished and improved form, it is still worn by the Horse Guards. The jack-boot is almost entitled to be called the parent of the top and some other varieties. Boots with tops of a yellow color were so commonly worn by gentlemen in the 18th century, as to become a peculiarity in the national costume of the English. Among jockeys and fox hunters, top boots are likely to remain in permanent use.

For many reasons the ancient domestic craft of shoemaking is dying out. Machine-made shoes being much cheaper, and answering the general need in appearance and wearing qualities, have generally superseded the hand-made article. A machine for sewing together soles and uppers was patented in the United States by Blake, and, as subse-

quently improved by Mackay, it became the apparatus which, for the period during which the patents were current, dominated the factory shoemaking industry. The Blake-Mackay machine sewed through outsole, upper and insole at one operation; but as the corporation owning the machine held the patent right for machine sewed boots and shoes, improvements by outsiders were for the time barred. Now there are in operation many varieties of sewing machines, some of which sew welted boots in all respects like the hand-made product.

Factory-made boots and shoes are now entirely cut out by machinery, the uppers are sewn by strong sewing machines, and soles and uppers are fastened together either by (1) sewing, (2) pegging with wooden pegs, (3) riveting with metal pins, or (4) screwing by means of the Standard screw machine. The latter most ingenious apparatus uncoils a reel of screwed brass wire, inserts it into the sole, and cuts off the wire flush with the outsole with remarkable rapidity; and for solidity and durability the work leaves nothing to be desired.

The manufactures in 1914 were as follows:

Boots and Shoes (total).....	216,039,401 pairs
Slippers (total).....	17,733,689 pairs

Since 1914 there has been an increase of about 25 per cent in manufacture. The domestic per capita consumption of men's shoes in 1914 was 2.9 pairs as contrasted with 2.6 in 1918; women's in 1914, 2.6 pairs compared with 4 pairs in 1918. In 1919-20 prices of shoes reached extremely high altitudes, but by the beginning of 1921 conditions had so readjusted themselves that a more normal basis of production and prices was indicated.

BOPP, FRANZ, a distinguished German Sanskrit scholar and philologist, born in Mainz, in 1791. In 1812 he went to Paris for the study of Sanskrit and Oriental literature, and remained there five years. After living for some time in London and Göttingen, he settled in Berlin, where he eventually became Ordinary Professor of Oriental Literature. He contributed much to the study of Sanskrit in Europe. His most important work in the field was his "Comparative Grammar of Sanskrit, Zend, Greek, Latin, Gothic, Old Slavonic and German," of which an English translation has been published. His library was purchased by Cornell University. He died in Berlin in 1867.

BORAH, WILLIAM EDGAR, an American public official; born in Wayne

co. Ill., in 1865; received his education at the Southern Illinois Academy, Enfield, Ill., and at the Kansas State University, Lawrence, Kan. He began the practice of law at Lyons, Kan., in 1890. He was elected to the United States Senate from Boise, Idaho, whither he had removed, and was re-elected in 1913 and 1919. He belonged to the Progressive wing of the Republican party and was a prominent and powerful figure in debate and legislation. He was a pronounced supporter of measures looking toward an effective prosecution of the World War. When the Versailles Treaty was up for ratification in the Senate he opposed it vigorously.

BORAX (sodium borate), a rather brittle, sweetish, alkaline mineral, found native as a saline incrustation on the shores of certain lakes in California, Persia, Tibet, India, China, Ceylon, and in parts of South America. When collected on the banks of the lakes it is impure, and goes by the name of tincal.

BORCHGREVINK, CARSTEN EGBERG, a Norwegian explorer and lecturer, born in Christiania, in 1864, his mother being English and his father a Scandinavian. He went to sea at an early age, but returned to go to college. In 1898 he went to Australia, joined the Survey Department, and scaled Mount Lindsay. In 1894-1895 he was in Antarctic waters, a region fully explored by him in 1897, when he attempted to reach the South Pole without success. In 1899 (Feb. 17) he had, however, reached Robertson Bay. Returning to London in 1900 he reported having reached lat. 78-50 S., long. 195.50 E., the farthest point S. ever reached by man. Consult his book, "First in the Antarctic Continent."

BORDEAUX (bor-dō'), a city and port of France, capital of the department of Gironde, on the Garonne river, about 70 miles from the sea. It is built in a crescent form round a bend of the river, which is here lined with fine quays and crossed by a magnificent stone bridge, and consists of an old and a new town. The former is mostly composed of irregular squares and narrow, crooked streets; while the latter is laid out with great regularity, and on a scale of magnificence hardly surpassed by any provincial town in Europe. In the old town are the Cathedral of St. André, St. Michael's Church, with its superb front of florid Gothic, the Hotel de Ville, and the Palais de Justice. There are extensive and finely planted promenades. Its position gives it admirable facilities for trade, and enables it to rank next

after Marseilles and Havre in respect of the tonnage employed. Large vessels sail up to the town. The chief exports are wine and brandy; sugar and other colonial produce and wood are the chief imports. Shipbuilding is the chief industry, and there are sugar refineries, woolen and cotton mills, potteries, soap works, distilleries, etc. Bordeaux is the Burdigala of the Romans. By the marriage of Eleanor, daughter of the last Duke of Aquitaine to Henry II. of England, Bordeaux was transferred to the English crown. Under Charles VII., in 1451, it was restored again to France. Montaigne and Montesquieu were born in the neighborhood; the latter is buried in the Church of St. Bernard. In the World War (1914-1918) Bordeaux became a great military port for the Allies, where troops were concentrated and supplies for the armies were received. Pop. about 262,000.

BORDEN, GAIL, an American inventor of food products, born in Norwich, N. Y., Nov. 6, 1801. After attaining prominence in public affairs in the South and West, he turned his attention to food products. Meat biscuit and pemmican were invented by him. Later he perfected a system of condensing milk. He died in Borden, Tex., Jan. 11, 1874.

BORDEN, SIR ROBERT LAIRD, Canadian Premier; born in Grand Pré, June 26, 1854. He was educated at Acacia Villa Academy, Horton, chose the law as a profession and was called to the bar in 1878, becoming Queen's Counselor in 1891. His practice in the Supreme Court of Canada has been extensive and successful. He early entered politics, and as a member of the Canadian Parliament took part in many debates between 1896 and 1900. Upon the resignation of Sir Charles Tupper in February, 1901, he was chosen leader of the Conservative party in the House of Commons. He was made Premier of Canada in 1911. During the World War, he was active in the dispatch of troops and supplies abroad, and did much to promote the triumph of the Allied cause. He attended the meeting of the British Cabinet in 1915, being the first Dominion representative that ever received such a summons. He was the representative of his country at the Imperial War Conference in 1918 and a delegate to the Peace Conference. He is a forceful speaker and an able party head. He retired in 1920 and was succeeded as Premier by W. Meighen, former Secretary of Interior.

BORDENTOWN, a city in Burlington co., N. J., on the Delaware river, the

Delaware and Raritan canal, and the Pennsylvania railroad; 57 miles S. W. of New York City. It is noted as being a former residence of Joseph Bonaparte, brother of Napoleon I. and for many years the house and grounds belonging to the estate possessed much interest for the tourist. The city is the seat of the Bordentown Military Institute, and other educational institutions. There are steam forge and iron works, foundry and machine shops, worsted mills, canning factories, a shipyard and other industries. Pop. (1910) 4,250; (1920) 4,371.

BORDER STATES, a name applied during the American Civil War to Delaware, Maryland, Virginia, Kentucky and Missouri, because they lay on the border line between the Free and the Slave States.

BORE, or **EAGRE**, a sudden influx of the tide into the estuary of a river from the sea, the inflowing water rising to a considerable height and advancing like a wall against the current. The most celebrated bores in the Old World are those of the Ganges, Indus and Brahmaputra. The last is said to rise to a height of 12 feet. In some rivers in Brazil it rises to the height of 12 to 16 feet. In Great Britain the bore is observed more especially in the Severn, Trent, Wye, and Solway.

BORE, in metallurgy, a tool bored to fit the shank of a forged nail, and adapted to hold it while the head is brought to shape by the hammer. The depression in the face of the bore is adapted to the shape required of the chamfered under part of the head. The word is also applied to the cavity of a steam engine cylinder, pump barrel, pipe, cannon, barrel of a firearm, etc. In mechanics it is expressed in inches of diameter; in cannon formerly in the weight in pounds of solid round shot adapted thereto, but since the introduction of modern rifled ordnance of the breech-loading pattern, the bore of cannon is always expressed in inches of diameter or in the equivalent of inches.

BOREAS, a bellowing wind; the northern wind; a cold northerly wind. In mythology, the son of Astræus and Eos, usually worshipped as the god of the north wind. The assiduity with which the worship of Boreas was cultivated at Athens proceeded from gratitude, the north wind having on one occasion destroyed the fleet of the Persians when meditating the invasion of Attica. A similar cause induced the inhabitants of Megalopolis to consider Boreas as their

peculiar divinity, in whose honor they instituted an annual festival. Boreas was usually represented with wings dripping with golden dewdrops, and the train of his garment sweeping along the ground.

BORECOLE, a variety of *brassica oleracea*, a cabbage with the leaves curled or wrinkled, and having no disposition to form into a hard head.

BORER, a name common to many insects of the Linnaean genus *ptinus*, the tribe *ptiniores* of Latrielle, coleopterous insects of small size, the larvæ of which—small, white, soft, wormlike creatures, with six minute feet—are furnished with strong, cutting jaws, by means of which they eat their way in old wood and similar substances, boring little holes as if made with a fine drill. More usually applied to the larvæ of the longicorn beetles. Borers are very destructive to fruit and ornamental trees.

BORGHESE (bor-gé'ze), a Roman family, originally of Sienna, where it held the highest offices from the middle of the 15th century. Pope Paul V., who belonged to this family, and ascended the Papal chair in 1605, loaded his relations with honors and riches. He bestowed, among other gifts, the principality of Sulmone on Marco Antonio Borghese, the son of his brother Giovanni Battista, from whom is descended the present Borghese family. **BORGHESE, CAMILLO, PRINCE**, was born in 1775; died in 1832. When the French invaded Italy he entered their service, and, in 1803, he married Marie Pauline, the sister of Napoleon (born at Ajaccio, 1780, died at Florence, 1825). In 1806 he was created Duke of Guastalla, and was appointed Governor-General of the provinces beyond the Alps. He fixed his court at Turin, and became very popular among the Piedmontese. After the abdication of Napoleon he broke up all connection with the Bonaparte family, and separated from his wife. The Borghese Palace at Rome was begun in 1590, and completed by Paul V. It contains one of the richest collections of art in the city.

BORGIA, CESARE (bor-jé-a), the natural son of Pope Alexander VI., and of a Roman lady named Vanozza, born in 1478. He was raised to the rank of Cardinal in 1492, but afterward divested himself of the office, and was made Duc de Valentinois by Louis XII. In 1499 he married a daughter of King John of Navarre, and accompanied Louis XII. to Italy. He then, at the head of a body of mercenaries, carried on a series of

petty wars, made himself master of the Romagna, attempted Bologna and Florence, and had seized Urbino when Alexander VI. died, 1503. He was now attacked by a severe disease, but found means, indeed, to get the treasures of his father into his possession, and assembled his troops in Rome; but enemies rose against him on all sides, including the new Pope, Julius II. Borgia was arrested and carried to Spain. He at length made his escape to his brother-in-law, the King of Navarre, and was killed before the castle of Viana, March 12, 1507. He was charged with the murder of his elder brother, of the husband of his sister Lucretia, etc. With all his crimes he was a patron of art and literature.

BORGIA, LUCRETIA, daughter of Pope Alexander VI., and sister of Cesare Borgia, was born in 1480. In 1493 she was married to Giovanni Sforza, Lord of Pesaro, but after she had lived with him for four years, Alexander dissolved the marriage, and gave her to Alphonso, nephew of Alphonso II. of Naples. Two years after this new husband was assassinated by the hired ruffians of Cesare Borgia. Her third husband was Alphonso d'Este, son of the Duke of Ferrara. She was accused by contemporaries of incest, poisoning, and almost every species of enormous crime; but several modern writers claim that she was maligned. She was a patroness of art and literature. She died in 1519.

BORGLUM, JOHN GUTZON DE LA MOTHE, an American sculptor and painter; born in Idaho, March 25, 1867. His early life was spent in the West, where he studied at the San Francisco Art Association. From 1890 to 1893 he pursued his art studies in Paris. He returned to California for two years and then took up his residence in London. He spent six years there, and was elected a member of British and French art societies. In 1902 he returned to New York, where his work speedily gained him recognition. Among his well-known works are the "Mares of Diomedes" in the Metropolitan Art Museum, New York, statues of Lincoln and Beecher and the figures of the Twelve Apostles in colossal size for the Cathedral of St. John the Divine.

BORGNE (born), an inlet of S. E. Louisiana. The Rigolets Pass opens to it a communication with Lake Pontchartrain, and it also connects with the Gulf of Mexico. Length about 60 miles; greatest width, 25 miles.

BORGO, a name given to a number of towns and villages in Italy and south-

ern Tyrol, and indicating the growth of the town or village around a castle or castellated rock, the original Borgo. Thus there are the Borgo, the N. part of Rome,



GUTZON BORGLUM

on the right bank of the Tiber; Borgo-Manéro, an Italian town, 20 miles N. N. W. of Novara, with 4,821 inhabitants; Borgo San Donnino, in the province of Parma, with 4,493 inhabitants, etc.

BORGOGNONE, AMBROGIO DA FOSSANO (*borg-ōn-yō'nē*) a Milanese painter of the transition stage between the old school and the great masters of the 16th century. His last and best work was the "Coronation of the Virgin" (1524), now in San Simpliciano, Milan. He died in 1535.

BORGU, or BUSSANGA, an African state, attached by treaty, since 1884-1886, to the Royal Niger Company, lying on both sides of the Niger river, and bordering on Gando and Illorin, provinces of the empire of Sokoto. The country is generally level, but rises in the N. into lofty ranges of hills, and is very fertile and thickly populated. It was at Boussa, one of the chief towns, that Mungo Park lost his life in 1805.

BORIC or BORACIC, ACID, an acid formed by dissolving boron trioxide (B_2O_3) in water. It occurs in the steam which issues from volcanic vents in Tus-

cany called *suffioni*, or fumaroles. These are directed into artificial lagoons, the water of which becomes charged with boric acid, and it is obtained from it by evaporation. Boric acid is supposed to be formed by the action of water on BN (nitride of boron), which is decomposed by it into boric acid and ammonia.

Boric acid is a most valuable antiseptic, and is particularly useful as a dressing for a wound from which it is probable pyæmia will result. It has a very marked effect in subduing the attacks of disease germs on the mucous membranes of the body, and, used in due season, will avert many evil consequences arising from contact with bacilli.

BORING, a process in mechanical and engineering operations, variously performed according to the medium dealt with. For making small holes in soft woods and like substances, awls are employed, which merely cut and displace a portion of the yielding material. In boring hard woods and large holes, carpenters use gimlets, augers, and the brace and bits, which all cut and scoop out the material. In the jewelry and small metal industries, hand drills, which consist of a spindle with steel bits, to which reciprocating rotation is given, are the implements for piercing small holes. The boring of holes in metal plates is effected by means of drills driven by machinery.

As applied to the earth and to rocks, boring embraces two classes of operations—boring of shot holes for blasting, and the sinking of bores in prospecting for minerals, and in forming wells for water, salt brine, and mineral oils. Blast holes in rocks are made from one to two—sometimes more—inches in diameter, and may pierce to the depth of 9 feet. Such holes are most simply made in hard rock by a steel-pointed drill, struck by a hammer, and turned partly round after each blow to make the hole cylindrical.

BORIS III., King of Bulgaria; born Jan. 30, 1894. He was the eldest son of King Ferdinand, and succeeded to the throne when the latter abdicated and fled to Vienna, Oct. 4, 1918.

BORNEO, an island, next to Australia and Papua, the largest in the world, is situated in the Indian Archipelago, in $7^{\circ} 3' N.$ — $4^{\circ} 10' S.$ lat., and $108^{\circ} 53'$ — $119^{\circ} 22' E.$ long. It is bounded on the E. by the Sea of Celebes and the Macassar Strait, S. by the Sea of Java, W. and N. by the Gulf of Siam and the China Sea. Its length is about 800 miles, with a breadth of 700, and an area of about 284,000 square miles.

Topography.—The coasts, which are often low and marshy, and rendered dangerous to navigation by numerous islets and rocks, present no deep indentations, though they are pierced by numerous small bays and creeks. A great part of the island must be described as mountainous. In the far N. rises the magnificent structure of Kinabalu (13,698 feet high), the culminating peak probably of the whole Indian Archipelago, and not unworthy in its picturesqueness of such a rank. Throughout the narrow northern portion of the island there runs a kind of central ridge in a general S. W. direction, with highest points ranging from 4,000 to 8,000 feet; and this can be traced, at least as a water parting, far to the S. W. So far as is known the mountain framework of the whole island consists, like Kinabalu, of eruptive and crystalline rocks of high antiquity. Of modern volcanic activity, so prevalent elsewhere in the Indian Archipelago, there is, in Borneo, no trace either in tradition or in the record of the rocks. A large portion of the surface, not covered by alluvium, consists of tertiary deposits, in regard to the age of which, however, geologists are not agreed. Though there are many powerful streams, navigable far inland for boats of considerable burden, their value as waterways is lessened by the bars which usually prevent the entrance of sea-going vessels, and in their upper reaches by frequent rapids and occasional waterfalls. In connection with the river systems there are numerous lakes in Borneo; but of true mountain lakes on a large scale there are probably few.

Climate and Productions.—The climate in the low grounds is humid, hot, and unhealthful for Europeans; but in the higher parts toward the N. the temperature is generally moderate, the thermometer at noon varying from 81° to 91° F. During the rainy season, from November to May, heavy storms of wind with loud thunder are experienced on the W. coast. The influence of the land and sea breezes passes inland to quite remarkable distances across the level plains and up the river valleys. Vegetation is extremely luxuriant. The forests produce ironwood, bilian, teak, ebony, sandalwood, gutta percha, dye woods, benzoin, wax, dragon's blood, sago, various resins, vegetable oils, and gums. The camphor of Brunei is the best in Asia. The mohor tree, well adapted for making native boats, attains a height of 80, and the kaladang, suited for large masts, of 200 feet. Nutmegs,

cloves, cinnamon, pepper, betel, ginger, rice, millet, sweet potatoes, yams, cotton in Amuntai, sugar cane in Sambas and Montrado, indigo, tobacco, coffee in Sambas, pineapples, cocoanuts, etc., are cultivated. The mountains and forests contain many monkeys, among which is the orang outang. Tapirs, a small kind of tiger, small Malay bears, swine, wild oxen or banteng, and various kinds of deer abound. The elephant is found only in the N., and the rhinoceros in the N. W. The few domesticated animals are buffaloes, sheep, goats, dogs, and cats. Fish is plentiful, and the coasts are rich in tortoises, pearl mussels, oysters, and trepang. Brilliant butterflies and moths are in great variety. Among the mineral products are coal, gold, and copper, especially in Montrado; antimony, iron, tin, platina, nickel, diamonds and other precious stones, rock crystals, porcelain clay, petroleum, and sulphur. The diamond mines are chiefly in Landak and Pontianak; Sambas produces the greatest quantity of gold; the kingdom of Brunei, Kutei, and Banjermassin, the largest amount of coal. The Pengaron coal field, worked by the Dutch Government, is one of the most important.

The People.—The population consists of three classes, the Dyaks or Dayaks, who are the aboriginal heathen inhabitants, and constitute the great bulk of the population; the Mohammedans or Malays—for this name is extended so as to include all professors of Islam, whether true Malays, Buginese, Javanesse, Dyaks, or Arabs; and the Chinese. The Dyaks live chiefly in the interior, and employ themselves with tillage and the collecting of gutta percha, resin, gums, ratans, gold dust, and wax. They are divided into numerous tribes. The Malays (taking the name ethnographically) dwell on the coasts, are traders and bold sailors. They are more civilized than the Dyaks, cultivate the grounds around their houses, lay out gardens, keep cattle, and live partly by fishing. The Chinese, chiefly from Canton, have penetrated far into the interior. They engage in trade and mining, are unwearied in their efforts to make money, and then return to their native country. They have always endeavored to live as independent republics (*kong-si*) under chiefs chosen by themselves, and according to Chinese laws. In 1857 the Chinese living in Sarawak rebelled, and were nearly exterminated. The Dutch were also compelled to put them down by force of arms, and have imposed a poll tax. The women of Borneo, except the Dyak, weave cotton

fabrics, make earthenware, baskets, and mats of beautiful designs and colors. In the district of Banjermassin are factories of weapons. The principal exports are gold, gold dust, diamonds, coal, ratans, gutta percha, edible nests, cotton, wax, timber, dye woods, mats, resins, sandalwood, camphor, etc.; the imports, earthenware, iron, steel, and copper work, piece goods, yarns, woolen and silk fabrics, medicines, provisions, wines, spirits, rice, sugar, tea, tobacco, opium, trepang, gambir, gunpowder, etc.

Political Divisions.—Borneo has never formed a political unity, and there is no native designation for the island as a whole. The name Borneo (Burnei or Brunei) in fact properly applies only to the Malay kingdom on the N. W. coast; and Kalamantan or Kalamantin, sometimes quoted as a general appellation, is also of limited purport. The following are the present political divisions:

(1) *Brunei*.—This originally included nearly the whole of the N. W. of the island. The Sultan has absolute authority. In 1847 he undertook not to surrender any of his territory to any other power without the sanction of the British Government. Capital, Brunei, 20 miles from the coast, on the river of the same name. Pop. 25,000. Its area was reduced by the erection of

(2) *Sarawak* into a practically independent principality by Sir James Brooke (1841-1868).

(3) *North Borneo*.—This territory consists partly of a portion of the old kingdom of Brunei, partly also of districts on the E. coast, claimed by the Sultan of the Sulu Islands. Against the British occupation of the Sulu territory, a protest was made by Spain, which had for some time been gradually incorporating the Sultan's possessions. As a matter of fact, the British North Borneo Company has been successful in appropriating and developing its territory, which, with an area of 30,709 square miles, and a coast line of 900 miles, is now divided into the East Coast residency and the provinces of Dent, Keppel, and Alcock, and has its capital at Elopura or Sandakan, the largest settlement, with 5,000 inhabitants. The population of the territory is estimated at 500,000.

(4) *Dutch Possessions*.—By far the largest part of the island is ruled directly or indirectly by the Dutch, who have divided it into the residency of the Western Division of Borneo, and that of the Southern and Eastern, the former having Pontianak as the seat of government, the latter Banjermassin. Be-

sides a number of smaller dependencies, the Western Division contains the kingdom of Landak, Tayan, Mampawa, Sukadana, Simpang, Matan, Sekadow, Sintang, Sambas. Pop. about 450,000. States forming the Southern and Eastern Division are Kotaringin, Banjermassin, and Martapura. Pop. about 783,000. Chinese, Malays, etc., are forbidden to ascend the river higher than the Kanpore Pilany. The same is the case with the basins of the Kapuas Mururg, known as the Little Dyak district. The population of the whole of the Dutch portion of the island is about 1,280,000.

(5) *The Island of Labuan*, off the coast of Brunei, has belonged to the British since 1846.

The chief towns in Borneo are Sambas (10,000), Pontianak (9,000), Banjermassin (30,000), Brunei (20,000), and Kuching (12,000).

History.—The Chinese had commercial dealings with Borneo as early as the 5th century, but they made no settlement for a long time after. The Malay kingdom of Borneo proper dates back to the 13th century. Another Malay settlement of later origin, Sambas, was at first dependent on Johore in the Malay Peninsula. Sukadana was founded by Hindu Javanese from the kingdom of Majapahit (see JAVA), and spread its influence on the whole S. part of the W. coast. Mampawa was a Buginese settlement, and Pontianak was founded as late as 1771 by a colony of Arabs, Malays, and Buginese. Islam began to be preached by Arabs from Palembang in the 16th century.

The Portuguese effected a settlement in 1690 at Banjermassin; from thence they were, however, soon expelled. The Dutch succeeded in concluding a treaty of commerce with the princes of Banjermassin. They erected a fort and factory in 1643, and a second in 1778 at Pontianak. The British made unsuccessful attempts in 1702 and 1774 to effect a settlement in Borneo, but, during the 19th century, they acquired a preponderating influence on the N. W. coast.

BORNU, or **BORNORO**, formerly a negro kingdom of central Africa, now included in northern Nigeria, somewhat larger in extent than England, bounded on the E. by Lake Tchad, and N. by the Sahara. The greater part of the country is perfectly level, and much of it is liable to be overflowed in the rainy season, which lasts from October to April. The heat from March to June is excessive, ranging from 104° to 107° F. The two principal rivers are the Shari and

the Komaduga Vaobe, both of which fall into Lake Tchad. The soil is fertile, yields plentiful crops of maize, millet, and other tropical produce. Wild beasts are very numerous. Coats of mail are made both for horses and their riders. The population, which is estimated at about 5,000,000, is mostly of negro race and called Bornuese or Kanuri. The ruling race, called Shuwas, are of Arab descent and bigoted Mohammedans; but many traces of fetishism remain among the masses. Whatever they have of civilization is derived from the Arabs. The shores and islands of Lake Tchad are inhabited by negro pirates called *yedina* or *budduna*. The slave trade was formerly eagerly prosecuted in Bornu. In the beginning of the 19th century, Bornu was conquered by the Fellatahs, whose yoke, however, was soon shaken off. The ruins of Birni, the old capital, on the Yaobe, may still be seen. Kuka, or Kukawa, the capital, is on the W. shore of Lake Tchad. Gornu, to the S. E., has one of the most important markets of central Africa.

BORO BUDOR (the "Great Buddha"), the ruin of a splendid Buddhist temple in Java, Kadu residency, near the junction of the Ello and Progo, is the most elaborate monument of the Buddhist style of architecture anywhere existing. Javanese chronicles place the building of the temple in the beginning of the 7th century. Boro Budor is built on a low hill.

BORODINO, a village of Russia, 70 miles W. of Moscow; on the Kaluga, an affluent of the Moskwa. It gave name to the great battle fought between the French army under Napoleon and the Russian under Kutusoff, Sept. 7, 1812. The battle of Borodino was one of the most obstinately disputed in history, and the loss on both sides was almost equally great. Out of 257,000 men engaged, between 70,000 and 80,000 were killed and wounded. The Russians retreated on the following day, but in the most perfect order, and, therefore, claim this battle as a victory; but the French, who name the battle from the Moskwa, have always maintained a similar claim.

BORO-GLYCERIDE, a compound of boracic acid with glycerine, represented by the formula $C_3H_5BO_3$. It is a powerful antiseptic, and being perfectly harmless is as useful in the preservation of food as in surgery, etc.

BORON, in chemistry, a triatomic element, symbol B. Atomic weight, 11. It occurs in nature combined in the form of boracic acid $B(OH)_3$ and its salts.

Boron is obtained by fusing boric tri-oxide B_2O_3 with sodium. It is a tasteless, inodorous, brown powder, a non-conductor of electricity; it is slightly soluble in water, permanent in the air; burnt in chlorine gas it forms boron chloride BCl_3 , a volatile, fusing liquid, boiling at 18.23, sp. gr. 1.35; it is decomposed by water into boric acid and hydrochloric acid.

BOROUGH, originally a fortified town. In England, a corporate town or township; a town with a properly organized municipal government. If it sends a representative or representatives to Parliament it is a parliamentary borough, if not, it is only a municipal borough. The qualifications for voters in both classes of boroughs are the same. In all boroughs a mayor is chosen annually, and a certain number of aldermen and councilors periodically, the burgesses or voters electing the councilors, and the councilors electing the mayor and aldermen. Mayor, aldermen, and councilors form the council. In the United States, an incorporated town or village, or division of a large city.

Under a ruling of the United States Board on Geographic Names, this word, when forming a part of a place word, is now abbreviated to boro, as Hillsboro.

BORROMEAN ISLANDS, a group of four small islands on the W. side of Lago Maggiore, northern Italy. They are situated in the W. arm of the lake, and are named after the ancient family of Borromeo. Vitaliano, Count Borromeo, about 1671, caused soil to be carried to them, built terraces, and converted them into beautiful gardens. The two most celebrated are Isola Bella and Isola Madre. On the W. side of Isola Bella, which rises above the water in 10 successive terraces, stands a palace of the Borromeo family, containing many admirable paintings and other works of art. Isola Madre is laid out in the same terraced style, and is crowned by a now dilapidated palace. The Isola de' Pescatori is inhabited by about 200 fishermen.

BORROMEO, CARLO, COUNT, a celebrated Roman Catholic saint and cardinal, born at Arona, on Lago Maggiore, in 1538. In 1560 he was successively appointed by his uncle, Pius IV., apostolical protonotary, refendary, cardinal, and Archbishop of Milan. The reopening and the results of the Council of Trent, so advantageous to the papal authority, were chiefly effected by the great influence of Borromeo, which was felt during the whole sitting of the council. He improved the discipline of the clergy, founded

schools, libraries, hospitals, and was indefatigable in doing good. He died in Milan, in 1584. Immediately after his death miracles were said to be wrought at his tomb, and his canonization took place in 1610. His nephew, COUNT FEDERIGO BORROMEO, also cardinal and Archbishop of Milan, equally distinguished for the sanctity of his life and the benevolence of his character, was born at Milan in 1564, and died in 1631. He is celebrated as the founder of the Ambrosian Library.

BORROW, GEORGE, an English philologist, born in East Dereham, Norfolk, February, 1803. His linguistic talents are shown in "Targum; or, Metrical Translations from Thirty Languages" (St. Petersburg, 1835), and "Romano-Lavo-Lil, or Word Book of the Romany" (1874). The other chief of his works are "The Zincali, or Gypsies of Spain" (London, 1841); "The Bible in Spain" (1843); "Lavengro" (1851); "The Romany Rye," its sequel (1857); "Wild Wales" (1862); and "Dictionary of the Gypsy Language" (1874). He died in Oulton, Suffolk, July 30, 1881.

BORSIPPA, a very ancient city of Babylonia, the site of which is marked by the ruins Birs Nimrud.

BOSCH BOK, the bush buck, a name given to several South African species of antelope.

BOSCH VARK, the bush hog or bush pig of South Africa (*choiropotamus africanus*), one of the swine family, about 5 feet long, and with very large and strong tusks. The Kaffirs esteem its flesh as a luxury, and its tusks as personal ornaments.

BOSCOBEL, a locality in Shropshire, England, remarkable historically as the hiding place of Charles II. for some days after the battle of Worcester, Sept. 3, 1651. At one time he was compelled to conceal himself among the branches of an oak in Boscobel Wood. The royal oak, which now stands at Boscobel, is said to have grown from an acorn of this very tree.

BOSHER, KATE Langley, an American novelist; born in Norfolk, Va., in 1865. She wrote in a humorous vein and with an appeal to wholesome sentiment that has won great popularity for her work. Her publications include "Mary Cary" (1910); "Miss Gibbie Gault" (1911); "The Man in Lonely Land" (1912); and "The House of Happiness" (1913).

BOSNA-SERAI, or **SARAJEVO**, the capital of the province of Bosnia, on the

Migliazza, 570 miles W. N. W. of Constantinople. It contains a palace, built by Mohammed II., to which the city owes its name. It was formerly surrounded with walls, but its only defense now is a citadel, built on a rocky height at a short distance E. from the town. Bosna-Serai is the chief mart in the province, the center of the commercial relations between Turkey, Dalmatia, Croatia, and south Germany, and has, in consequence, a considerable trade, with various manufactures. Pop. about 52,000.

BOSNIA, a province of Jugoslavia, in the N. W. of the Balkan Peninsula, W. of Servia. Area including Herzegovina and Novi-bazar, 23,570 square miles (of which Bosnia proper occupies 16,000), pop. about 1,900,000, mostly of Slavonian origin, and speaking the Serbian language. They are partly Mohammedans, partly Roman and Greek Catholics. The country is level toward the N.; in the S. mountainous. Its chief rivers are the Save, the Verbas, the Bosna, Rama, and Drina. About half the area is covered with forests. Tillage is carried on in the valleys and low grounds; maize, wheat, barley, rye, buckwheat, hemp, tobacco, etc., being grown. Fruits are produced in abundance. Sheep, goats, and swine are numerous. The minerals include coal, which is worked in several places, manganese, antimony, iron, etc. Among the manufactures are iron goods, arms, leather, linens, and woolens. Sarajevo, the capital, was the scene of the assassination of the GRAND-DUKE FRANCIS FERDINAND (*q. v.*) and his consort on June 24, 1914, which led to the World War.

Bosnia, in ancient times a part successively of Illyria, Pannonia, and Dalmatia, was, during the great migrations occupied by Slavs or Slavonized Illyrians, at first dependent on Hungary; but it became a kingdom in 1376, under Tivartko, a native prince. Occupied by the Turks in 1401, it was annexed in 1463, but not recognized by Europe as a Turkish province till 1699. Extortionate taxation caused a rebellion of the Christians, in 1849, suppressed by Omar Pasha; but a more determined rising in 1875, which the Turks failed to put down, led to the occupation of the province by the Austro-Hungarians, which the Moslem population opposed in a fierce but unavailing struggle. The Treaty of Berlin formally intrusted the administration to Austria-Hungary, the nominal supremacy of the Sultan being recognized in 1879. From 1880 Austrian methods of government were gradually introduced. On Oct. 5, 1908, in violation of the Treaty of Berlin,

Austria extended her sovereignty over Bosnia and Herzegovina, supported in the war by Germany. Serbia was all for war against her powerful neighbor, but Russia being unprepared for a conflict with Austria and Germany, urged moderation. After the break-up of Austria in 1918, Bosnia became a part of the new state of Jugoslavia.

BOSPORUS or **BOSPHORUS**, the strait, 19 miles long, joining the Black Sea with the Sea of Marmora, called also the Strait of Constantinople. Prior to the World War it was defended by a series of strong forts; and by agreement of the European powers no ship of war belonging to any nation could pass the Bosphorus without the permission of Turkey. Over this channel (about 3,000 feet wide) Darius constructed a bridge of boats on his Scythian expedition. The Cimmerian Bosphorus was the name given by the ancients to the strait that leads from the Black Sea into the Sea of Azov. There was also, anciently, a kingdom of the name of Bosphorus, so called from this strait, on both sides of which it was situated. The Bosphorus was the scene of great activities during the World War. See **DARDANELLES**; **TURKEY**; **WORLD WAR**.

BOSS, an elevated or thickened portion, usually around an aperture, or a swage or stump used in shaping sheet metal. In Gothic architecture it is the protuberance in a vaulted ceiling formed by the junction of the ends of several ribs, and serving to bind them together; usually elaborately carved and ornamented.

BOSS, LEWIS, an American astronomer, born in Providence, R. I., Oct. 26, 1846; was graduated at Dartmouth College, in 1870; astronomer of the Northern Boundary Survey for the determination of the line between the W. part of the United States and British America; and, since the completion of that work, Director of the Dudley Observatory, Albany, N. Y. He was chief of the United States party sent to Chile in 1882 to observe the transit of Venus; was elected a member of the National Academy of Science, in 1889, and an honorary foreign associate of the Royal Astronomical Society, in 1890. He is best known for his work upon star declinations. After 1909 he edited the "Astronomical Journal." In 1911 he received the Lalandi prize from the French Academy of Science. Among his important works are: "Catalogue of 8,241 Stars"; "Positions and Motions of 627 Standard Stars" (1910); "Catalogue of 1,059 Standard Stars" (1911).

BOSSUET, JACQUES BÉNIGNE (*bosü-ä'*), a French theologian, born in Dijon, Sept. 27, 1627. At the age of 15 he entered the College of Navarre, where he studied Greek and the Holy Scriptures, read the ancient classics, and investigated the Cartesian philosophy. In 1652 he was ordained priest, and made a canon of Metz. In 1670 he was appointed preceptor to the Dauphin, and in 1681 he was raised to the see of Meaux. He drew up the famous propositions adopted by the assembly of French clergy, which secured the freedom of the Gallican Church against the aggressions of the Pope. He opposed Quietism, and prosecuted Madame Guyon; and when his old friend Fénelon defended her he caused him to be exiled. He died in Paris, April 12, 1704.

BOSTON, the largest city of New England, the capital of Massachusetts and the county-seat of Suffolk co. It is situated at the Boston harbor and at the mouths of the Mystic and Charles rivers. It is also on the New York, New Haven and Hartford, and the Boston and Maine railroads. It has regular steamship communication to all important domestic and foreign points. The city has an area of 47.81 square miles. The city includes Boston proper, and the suburbs of East Boston, South Boston, Roxbury, Dorchester, Charleston, Brighton, West Roxbury, and other outlying communities. Within a 50 mile radius of the city more people live than in any other similar area in the United States with the exception of New York. Old Boston or Boston proper occupies a peninsula of about 700 acres of uneven surface and contained originally three hills, known as Beacon, Copp and Fort. From these hills the place was called by the early settlers Trimountain, later changed to Tremont. Extending about two miles along the harbor and separated from Boston proper by an arm of it, is South Boston, containing large docks and warehouses. The city is connected with Charleston and Cambridge by several bridges. The harbor is an indentation of Massachusetts Bay, embracing about 75 square miles, with numerous arms, and containing many islands. The population of the city, according to the census of 1920 was 748,060. The estimated population of the metropolitan district in 1920 was 1,824,746. Within this metropolitan district are included Cambridge, Lynn, Waltham, Somerville, Malden and other cities.

Boston has one of the finest natural harbors of the world, with a water frontage of more than 40 miles, most of which is in active use for commercial purposes.

In the older portions of the city the streets are narrow and irregular, but since 1872, when the city was visited by a destructive fire, much has been done toward straightening them. The newer section built on recovered land on the Back Bay and the Fenway are far more regular and handsome in appearance. The financial center of the city is State street. The retail center is on Washington, Tremont, and Winter streets. On High and the neighboring streets are the boot and shoe markets. The wholesale dry goods establishments are on Franklin, Chauncey, Summer, and neighboring streets. The suburbs of the city are exceedingly attractive because of their natural beauty and notable buildings.

Boston is the center of the largest shoe and textile manufacturing community in the world. It is the commercial metropolis of New England and is the greatest wool and leather market in the United States. It has also a large commerce in grain, cotton, iron, steel products, sugar, flour, hides and leather, and meats and dairy products. The manufactures include boots and shoes, foundry and machine-shop products, musical instruments, machinery, clothing, iron ware, books, brass goods, confectionery, rubber goods, and many others. It is also the greatest fish market in the world. There were in 1917 2,653 industrial establishments. The value of the products of industry in 1918 was \$522,646,032. The capital invested in the same year was \$281,497,115. The average number of wage earners employed was 88,763. The total amount paid in wages in 1917 was \$68,002,939. The value of the exports of the city in 1919 was \$334,554,031, and of the imports \$299,364,999, or a total trade of \$633,919,030. Boston ranks second among the cities of the United States as a shipping center and has an important seaport. It ranks fourth in the total of foreign trade, in the amount of bank clearings, assessed valuation, and population. It ranks eighth in the value of the manufactured products. The chief exports are iron and steel products, meat and dairy products, breadstuffs, boots, shoes, and leather, metal, cotton and cotton products, rubber products, paper, chemical products, and dyes. The chief imports are wool, cotton, hides and skins, fiber products, sugar and molasses, chemicals, drugs and dyes, leather and fish.

In 1919 Boston was the richest community per capita in the United States. The total assessed valuation of the city in that year was \$1,528,165,778.

Boston is noted for its magnificent

park system. There are within the city limits 24 large parks and 42 separate playgrounds, with a total of 327 acres. There are in addition 14 playgrounds and parks with an area of 155 acres. There are also 75 smaller parks and squares, making a total of 2,688.5 acres. The cost of the main park system from 1877 is \$11,788,065. The largest park is Franklin Park, named for Benjamin Franklin, containing 527 acres, of which about 80 are occupied by the zoological gardens. There are also within the city limits 958 acres of metropolitan parks and parkways under State control, the largest of which is Stony Brook Reservation in West Roxbury. The most noted parks within the city limits are the Common and the Public Garden. These contain many memorials, including statues of Washington, Edward Everett, and others.

The school system has always been noted for its excellence. Boston spent more per capita for school purposes than any other city in the United States. There is an extensive system of kindergarten and primary grade schools, besides a large number of secondary schools. There were in 1920, 264 permanent school buildings, and 137 portable houses. There were 3,413 teachers in all the schools. The number of pupils registered in the day schools in 1919 was 122,452, in the evening schools 8,260, and in the continuation schools were registered 9,651. The valuation of the school property was \$27,670,000, and the cost of maintenance was \$7,373,499. The institutions for higher education in the city included Massachusetts Institute of Technology, Boston University, the New England Conservatory of Music, and Simmons College and Boston College. Within the metropolitan area are Harvard University and Tufts College. Among the notable and historical buildings in the city are the State House on Beacon Hill, the Boston Atheneum on Beacon street, a Masonic temple on the corner of Tremont and Boylston streets, the Public Library in Copley Square, and the Museum of Fine Arts in Copley Square. The Public Library is one of the largest and best equipped in the United States. It contained in 1920 1,197,498 volumes, of which about 300,000 were in the branch libraries. The city is well equipped with theaters and other public buildings. There were in 1919 39 theaters. The Mechanics' Building on Huntington avenue seats 4,350 people, the Boston Opera House 3,000, the Symphony Hall 2,569, and Tremont Temple 2,441.

Among the buildings which date from colonial times and are of great historical value are Faneuil Hall, known as the

cradle of liberty, and erected in 1742; the Old State House, erected in 1748; the Old South Church, the Old North Church, and Kings Chapel.

The city has excellent transportation facilities, which include surface, underground, and elevated railroads. The Tremont street subway, opened in 1897, was the first municipal subway in the United States. There are now completed the East Boston tunnel, Washington street tunnel, the Cambridge connection subway, the Boylston street subway, the East Boston tunnel extension, and the Dorchester tunnel. The total approximate cost of all subways and tunnels is \$36,000,000.

There are 345 churches of all denominations, including Roman Catholic, 65; Jewish, 38; Baptist, 35; Congregational, 36; Unitarian, 24; Methodist Episcopal, 31; Protestant Episcopal, 36; Lutheran, 12; and Presbyterian, 11. The mother church of the Christian Scientists is located in Boston and is one of the most beautiful structures in the city.

There were in 1920 15 National banks, with an aggregate capital of \$28,959,000. There were also 30 trust companies with a capital of \$26,901,100. The total resources of the National banks were \$601,284,213. There were 24 savings banks with deposits of \$341,215,952. The city is the seat of a branch of the Federal Reserve Bank.

The net funded debt of the city in 1919 was \$82,287,030. The tax rate was \$2.12.

Boston was settled in 1630 by a party of Puritans from Salem. It was named after a town in Lincolnshire, England, from which most of the colonists had come. In 1632 the first meeting house was erected, and in 1635 a public school was built. In the same year the first grand jury in the country met here. A memorable massacre occurred here in 1770, and in 1773 several cargoes of English tea were thrown overboard in the harbor by citizens exasperated by the imposition of taxes. During the early part of the Revolution the British were quartered in the town. The battle of Bunker Hill was fought on Breed's Hill, within the present city limits, June 17, 1775. Washington forced the British to evacuate in 1776. The city charter was granted in 1822, and in 1872 a great fire broke out in the business portion of the city and destroyed about 65 acres of buildings. This part of the city was soon rebuilt, and, since then, Boston has been one of the most prosperous cities in the United States.

BOSTON, a seaport in Lincolnshire, England, 107 miles N. E. of London. Its name is a contraction of Botolph's town,

and it is commonly supposed to occupy the site of the Benedictine Abbey founded on the Witham by St. Botolph in 654, and destroyed in 870 by the Danes. The parish church of St. Botolph measures 283 by 99 feet, and is one of the largest without transepts in England. In 1843 the restoration of the church was commenced, the work continuing 10 years, and over \$50,000 being expended. A chapel to the memory of the Rev. Thomas Cotton, at one time Vicar of Boston, was erected at the expense of the inhabitants of the city of Boston, Mass. A promenade by the river is tastefully laid out, with a people's park, public gardens, and recreation ground adjoining. Boston has also a free grammar, charity, national, and other schools, a guildhall, etc. The chief exports are coal, machinery, corn, and wool; and the imports consist of timber, maize, cotton seed, and general merchandise. The river and canals furnish communication with Lincoln and several other towns. Boston is a great market for cattle and sheep, and has manufactures of canvas, sail cloth, ropes, sacking, beer, iron, brass, leather, bricks, whiting and hats, with some shipbuilding. Fox, the martyrologist, and Herbert Ingram, founder of the "Illustrated London News," to whom a statue was erected in 1862, were natives of Boston. Since the Distribution of Seats Act (1885) Boston returns only one member to Parliament. The town owns extensive docks. Pop. about 17,000.

BOSTON MASSACRE, an affray in that city, March 5, 1770, that resulted from the exasperated feeling between residents of the town and the British soldiers quartered there. It began on the 2d of March, with the exchange of insults and blows between a group of workmen and some passing soldiers. Minor injuries resulted, but the affair was stopped before it had reached large proportions. Three days later, toward evening, another party of soldiers was denied passage by a crowd of people armed with canes and clubs. The officer of the detachment sent his soldiers back, and then the crowd began to taunt a sentinel on guard in front of the Custom House. He struck a boy with the butt of his musket, and the latter ran off and brought up a crowd, who pressed upon the sentinel with shouts of "Kill him! Knock him down!" The sentinel was assailed with a shower of snowballs and driven up the steps. He called for assistance and his comrades responded, their colonel, Preston, at their head. The crowd surged about them, and at last a volley was fired by the soldiers that

resulted in the killing of three men and the mortal wounding of two others. Alarm bells were rung, enraged citizens hurried to the scene and there was tremendous excitement, that was quieted only when Preston was put under arrest by order of Lieutenant-Governor Hutchinson and the soldiers ordered back to their barracks. A trial ensued and Preston, who was defended by eminent counsel, including John Adams and Josiah Quincy, was acquitted, while two of the soldiers who were found guilty of manslaughter were branded in the hand and discharged. A monument was erected in 1888 to the memory of the victims.

BOSTON MOUNTAINS, a mountain range in western Arkansas, extending into the Indian Territory; highest summits, 3,000 feet above the sea.

BOSTON TEA PARTY, THE, a famous exploit preceding the American Revolution. In order to make as emphatic a protest as possible against the British crown's policy of taxing imports, a party of Bostonians, disguised as Indians, threw into the water on the night of Dec. 16, 1773, the cargoes of three English tea ships that had just arrived in the harbor. Enraged at this act, Parliament passed (March, 1774) the Boston Port Bill, taking away from that town the privileges of a port of entry from June 1, 1774, on. This bill aroused much indignation in the colonies and was an important factor in precipitating the outbreak of hostilities.

BOSTON UNIVERSITY, a coeducational institution in Boston, Mass.; organized in 1869 under the auspices of the Methodist Episcopal Church. The university reported at the end of 1919: Professors and instructors, 364; students, about 5,700; volumes in the libraries, 63,000; productive funds, \$3,212,448; income, \$160,000; president, L. H. Murlin, D. D., LL. D.

BOSWELL, JAMES, a Scotch biographer; the eldest son of Lord Auchinleck, one of the Supreme Judges of Scotland, born in Edinburgh, Oct. 29, 1740. He was educated at Edinburgh and Cambridge, became a member of the Scottish bar, but rarely practiced. In 1763 he became acquainted with Dr. Johnson—a circumstance which he himself calls the most important event of his life. In 1768, when Corsica attracted much attention, he published his account of Corsica, with "Memoirs of Paoli." In 1785 he settled at London, and was called to the English bar. Being on terms of the closest intimacy with Dr.

Johnson, he carefully recorded his sayings, opinions, and actions, for future use in a biography. In 1773 he accompanied Johnson on a tour to the Scottish Highlands and the Hebrides, publishing an account of the excursion after their return. His "Life of Samuel Johnson," one of the best pieces of biography in the language, was published in 1791. He died in London, May 19, 1795. His son, ALEXANDER, born in 1775, created a Baronet in 1821, killed in a duel in 1822, excelled as a writer of Scotch humorous songs.

BOSWELLIA, named after Dr. John Boswell, of Edinburgh, Scotland. A fine genus of terebinthinous trees belonging to the order *amyridaceæ* (*amyrids*). *B. thurifera*, called also *B. serrata*, furnishes the resin called olibanum, which is believed to have been the frankincense of the ancients. It is found in India, as also is *B. glabra*, the resin of which is used instead of pitch. The products of the entire genus are more or less used in pharmacy.

BOSWORTH, or MARKET BOSWORTH, a small market town in Leicestershire, England, 12 miles W. by S. of Leicester. On a moor 2 miles to the S. was fought (1485) the battle in which Richard III. was slain, and which terminated the Wars of the Roses. On an elevation, called Crownhill, Lord Stanley placed the crown on the head of the Earl of Richmond, Henry VII.

BOTANY, the natural history of the vegetable kingdom, the science that treats of plants. It forms, with zoology, the subject of biology in its more comprehensive sense. Plants are living beings which derive their chief sustenance on the one hand from water, which, together with certain dissolved mineral substances, they take in through their roots from the soil, and on the other from carbonic acid gas, which they absorb through their leaves from the atmosphere. Plants alone are able thus to unite inorganic materials and create from them organic compounds capable of sustaining life. Plants thus have, in the economy of nature, the important function of forming from the crude substances of the mineral kingdom the elaborated food materials necessary, not only for their own vital energies, but for the direct or indirect support of all animal life as well. The process by which plants accomplish this chemical change is called assimilation and is carried on only through the agency of light and in the presence of their peculiar green pigment, known as leaf green or chloro-

phyll. The first product of the process (which is chemically one of deoxidation) is starch. Nitrogen, sodium, sulphur, and a few other elements are taken in by plants through their roots and in the form of dilute solutions. These elements combine with the starch derived by assimilation and form protoplasm and the other highly complex substances of the plant.

All plants, like animals, are composed of small bodies, which at least in their early stages, are microscopic masses of protoplasm, each provided with a specialized portion known as a nucleus. These bodies are called cells, although the name is inappropriate and founded upon the crude and mistaken ideas of the earliest microscopists. Plant cells differ from animal cells in the fact that they are not naked, but are each enveloped in a peculiar, usually transparent membrane of cellulose, a tough, elastic substance in composition allied to starch. In the simplest plants, it is often called protophytes. The cells are solitary, few, or, if more numerous, are essentially alike, being grouped usually in gelatinous masses. In the higher plants, however, the cells are always very numerous and many of them undergo great changes, some being transformed to tubes or vessels for the transmission of the sap, others being elongated and hardened into woody fibers, serve to give strength to the plant body, while still others, such as those of the outer layer (epidermis) assume a protective function.

Botany may be divided into three chief branches.

Structural Botany.—Structural botany includes all inquiries into the form, arrangement, internal anatomy, and composition of plants and their members.

Physiological Botany.—Physiological botany treats of the vital processes of the plant, both physical and chemical.

Systematic Botany.—Systematic botany deals with the different kinds of plants and groups them according to their racial affinities into orders, families, genera, species, varieties, and forms. Botanical histology is a term commonly applied to the minute anatomy or microscopic structure of the plants, especially of their tissues. Cytology deals with the physiology and histology of the individual cells. Vegetable pathology is a branch of physiology treating of plant diseases. Ecology comprehends a recently developed and highly interesting examination of the relations which exist between the structure of the plant and its environment. Economic botany treats of the

uses of plants and has its application in agriculture, horticulture, forestry, pharmacy, and medicine.

Plants may be divided into (1) those which are reproduced by means of minute one-celled bodies, destitute of an embryo, and called spores; and (2) those which are propagated by multicellular seeds containing each a latent and extremely rudimentary plantlet, the embryo. Plants of the former class have long been known as cryptogams or flowerless plants, the term sporophytes being preferred by many critical writers. The cryptogams include the following groups: Fungi (molds, mildews, rusts, smuts, toadstools and mushrooms); algæ (sea weeds, diatoms, desmids, etc.); lichens, scale mosses, or liverworts, true mosses, ferns, and fern allies (club mosses, horse tails, or scouring rushes, etc.). The fungi, algæ, and lichens are grouped together under the name thallophytes and the scale mosses and true mosses under the name of bryophytes, while the ferns and their allies are often called pteridophytes. Fungi differ from algæ in the uniform lack of chlorophyll or green coloring matter. Lichens, the scale-like incrustations, usually of a gray or brown color, found upon rocks, tree trunks, etc., are composite beings, including green cells like those of algæ, but surrounded by fine, usually colorless, filaments like a fungus.

Bryophytes.—The most striking feature of the bryophytes (mosses) and pteridophytes (ferns) is a strongly developed alternation of generations. Thus, in a fern, the spores, after falling to the ground, do not produce directly another plant like the one which bore them, but give rise to a minute plantlet, often heart-shaped, known as a prothallium. Upon this are borne the antheridia, or male organs, and archegonia, or female organs. Fertilization is accomplished by motile antherozoids, developed in the antheridia.

Flowering Plants.—The other great division of the vegetable kingdom comprises the phanerogams or flowering plants. From the fact that they produce true seeds, they are technically known as spermatophytes. Flowering plants include all our ordinary trees and shrubs of temperate climates as well as most of the herbaceous vegetation growing upon the land. In a complete or highly developed flower there are four series of parts. The outermost, which is also the lowest on the stem, is the calyx. It is usually more or less cup-shaped and commonly green. If it is divided to the base, its parts are known as sepals. Its function is, in general, protective. It shields

the innermore delicate parts of the flower, especially in the early and tender stages, against injury from the weather, destructive insects, etc. The next series of floral members is the corolla, which is usually showy and of a color other than green. Its function is, in part, protective, but its bright coloration, as well as its peculiar forms, has undoubtedly been developed to attract and facilitate the visits of insects for the fertilizing of the flower. The corolla may consist of a cup or tube or may be made up of separate parts, the petals.

Interior to the petals are the stamens. These consist of a thread-like stalk portion, the filament, and a usually two-celled sac, the anther. In the cells of the anther is the dustlike pollen. At the center of the flower stands the pistil. This may consist of a simple, highly modified leaf, or may be composed of several such members, the carpels, more or less completely fused together. When fully developed, the pistil has three parts, a basal sac, the ovary, surmounted by a short or long columnar portion, the style, which in its turn, bears at or near its usually enlarged summit, a soft, often viscid area, the stigma, for the reception of the pollen. In the ovary are one or more globose or oval bodies, the ovules, which, after fertilization by the pollen, become seeds. These ovules are borne upon the incurved edges of the carpels, although this fact is often very obscure.

The pistil and stamens are the essential parts of the flower, while the calyx and corolla, one or both of which may be wholly lacking, are accessory parts. When stamens and pistil are found in the same flower, it is said to be perfect. When they occur in different flowers upon the same individual, the plant is said to be monoecious, while a species in which stamens are borne in the flowers of one individual and the pistils in the flowers of another is dioecious.

In order that a flower may perfect seeds, it is (with certain rare exceptions) necessary that the pollen grains be transferred from the anthers to the stigma. This transfer, pollination, is sometimes effected by a contrivance or movement within the flower itself. External agents, however, are often necessary. These are chiefly wind, currents of water, or insects.

Flowering plants are primarily divided into the gymnosperms (sago palms, pines, firs, larch, juniper, gingko, etc.), which have no closed ovary, and the angiosperms, in which the seeds are inclosed in a sac-like ovary. The latter group is again divided into two great sections

according to the number of rudimentary leaves in the embryo. The monocotyledons, which have only one seed leaf or cotyledon, include the grasses, sedges, rushes, cat tails, palms, lilies, orchids, etc. These plants usually have leaves with parallel veins and flowers built upon the plan of three. They are also called endogens from the fact that the growth of their stems in thickness is effected not by the addition of external layers, but by the expansion and increased complexity of their internal tissues. The angiosperms, with two seed leaves, are the dicotyledons or exogens, having usually net-veined leaves, and flowers more often upon the plan of five. Exogens include the willows, oaks, elms, pinks, buttercups, mustards, roses, beans, violets, asters, etc.

Classification.—The more noteworthy ancient writers upon plants were Hippocrates (460-357 B. C.), Theophrastus (372-287 B. C.), Pliny (23-79 A. D.), and Dioscorides of the 2d century. The 14th to the 17th centuries produced many botanists of a type known as herbalists, whose often ponderous works contain crude complications of the known sorts of plants, with hints of their uses. During this period the idea of genera among plants was evolved with greater and greater clearness. Linnaeus was the first to give to each kind of plant known to him a double designation, consisting of a generic name followed by a specific name, thus: *Rosa lucida*, *Viola pedata*, *Claytonia Virginiana*, *Claytonia Carolina*.

The arrangement of families most generally followed during the 19th century has been that developed by the Genoese botanist, Auguste Gyrame De Candolle, and his son, Alphonse De Candolle. The De Candollean system received its most perfect exposition in the "Genera Plantarum" of the two English botanists, George Bentham (nephew of Jeremy Bentham, the philosopher) and Sir Joseph Dalton Hooker, and was followed in all the systematic writings of Prof. Asa Gray. This system, while undoubtedly possessing great merit in its details, unhappily fails to coincide with what is believed to be the historic sequence in which the different families have been evolved during past geological ages. It is, for this reason, rapidly giving place to a more philosophic system, elaborated by the German botanist, A. W. Eichler (1839-1887) and subsequently developed with great perfection in an extended work upon the "Natural Families of Plants" prepared under the editorship of Professors Engler and Prantl. The system, embracing all plants, begins with

the simplest cryptogams and ends with the *compositæ*, the great family, to which belong the golden rod, aster, thistle, and dandelion.

The subject of vegetable physiology, although dating its beginnings from the observations of Stephen Hales (1677-1761) upon the movement and pressure of sap, made but little advance before 1850. It was from that time greatly stimulated by the acute observation and close reasoning of Charles Darwin in England, and Prof. Julius von Sachs in Germany. Subsequent leaders in this line of investigation have been W. Pfeffer and Edward Strasburger. Anatomical botany is greatly indebted to Anton de Bary. The most meritorious works upon botanical geography, a subject which treats of floral conditions and the distribution of the plants in different countries, have been those of A. H. R. Grisebach, Adolph Engler, and A. F. W. Schimper.

The rapid growth of agricultural colleges in this country, fostered by Government and State aid, has given a great impulse to the study of botany. That branch of it which concerns itself with the diseases of plants, called pathology, has been carried to a point of efficiency not yet reached in any other country. The methods of American botanists have caused systematic botany or taxonomic botany to register great advances during the two decades of the present century. There is now under way a complete revision of North American flora in the light of the geographic relationships of plants. Future progress is likely to be based on the principles of heredity in plants and the correlation of plant functions with plant structure.

BOTANY BAY, a bay of New South Wales, Australia, 5 miles S. of Sydney. It was discovered by Captain Cook, on his first voyage, in 1770, and named by him from the great number of new plants found in its vicinity. In 1787 it received England's first penal colony in the East; and, though it was supplanted the very next year by Port Jackson, yet it long continued to be the popular designation, not merely of this penal settlement, but of the Australian convict settlements generally.

BOTHA, LOUIS, a Boer commander, born in Greytown, Natal, about 1864. He began life as a farmer, and, as a young man, had a share in the establishment of the Transvaal Republic. Later he fought in the Kaffir campaign. He was elected to the Volksraad at Pretoria. Upon the outbreak of the Boer war with

England in 1899, he was given a subordinate command, and, upon the death of General Joubert, in March, 1900, he became commander of the Boer forces. He demonstrated great capacity by his victories at Spion Kop and Colenso. He was chief representative of the Boers in the



GEN. LOUIS BOTHA

peace negotiations in 1902; Prime Minister of the Transvaal in 1907; Prime Minister Union of South Africa in 1910. In 1915 he led the Union forces that crushed the rebellion in Southwest Africa. He worked patiently to establish friendly relations between the Boers and the British. He died in Pretoria in 1919.

BOTHNIA, the name formerly given to a country of northern Europe, extending along the E. and W. shores of the Gulf of Bothnia, the E. portion now being comprised in Finland, and the W. in Sweden.

BOTHNIA, GULF OF, the N. part of the Baltic Sea, which separates Sweden from Finland; length about 450 miles, breadth 90 to 130, depth from 20 to 50 fathoms. Its water is but slightly salt, and it freezes in the winter, so as to be passed by sledges and carriages.

BOTHWELL, a village of Scotland, 8 miles E. of Glasgow. About a mile distant, toward the S. E., the road to Hamilton is carried over the river Clyde by Bothwell Bridge, the scene of one of the most memorable events in Scottish history. The Covenanters, numbering from 4,000 to 5,000 men, having taken possession of the bridge, were attacked, on June 22, 1679, the bridge forced, and their army totally routed by the royal troops commanded by the Duke of Monmouth. Near the village is the magnificent ruin of Bothwell Castle.

BOTHWELL, JAMES HEPBURN, EARL OF, known in Scottish history by his marriage to Queen Mary, born about 1526. It is believed that he was deeply concerned in the murder of Darnley, Mary's husband, and that he was even supported by the Queen. He was charged with the crime and tried, but, appearing along with 4,000 followers, was readily acquitted. With or without the Queen's consent he seized her at Edinburgh, and carrying her a prisoner to Dunbar Castle prevailed upon her to marry him after he had divorced his own wife. But the nation was now aroused against Bothwell. A confederacy was formed and Mary became a prisoner while Bothwell was forced to flee to Denmark, where he died in 1576.

BOTOCUDOS, the most barbarous of the Indian tribes of Brazil, inhabiting the East Coast range, between the Rio Pardo and the Rio Doce. They are of



BOTOCUDOS INDIAN

middle height, sturdily built, and have small hands and feet; their features are strongly marked, with broad cheek bones, and repulsively thick lips and nose, re-

deemed by white, regular teeth, and sparkling black eyes. They are rather yellow than copper colored, and their hair, of which only a tuft is worn on the smooth shaven head, is not quite black. Their name is derived from the Portuguese, *botoque*, bung hole, with reference to their under lip, pierced to hold a disc of wood, sometimes $3\frac{1}{4}$ inches in diameter. They generally go quite naked, and have no fixed settlements, but in their wanderings through the country keep the routes open by means of bridges of creepers woven into ropes. Their food includes anything not absolutely poisonous that will stay their hunger; even soft earth is eaten. Their speech is entirely distinct from that of the other Indian nations; they have no religion, properly speaking, but are abjectly afraid of spirits, and pay a certain worship to the moon as creator of the world. Ungovernably passionate, they often commit outrageous cruelties; but through systematically cruel treatment they have been almost annihilated, and now number not more than 4,000.

BO-TREE, the *ficus religiosa*, pipal, or sacred fig-tree of India and Ceylon, venerated by the Buddhists and planted near their temples. One specimen at Anuradhapura, in Ceylon, is said to have been planted before 200 B. C. It was greatly shattered by a storm in 1887.

BOTRYCHIUM, a genus of ferns belonging to the order *ophioglossaceæ* (adders' tongues). *B. lunaria*, or common moonwort, occurs in dry mountain pastures in Europe. *B. virginicum*, an American species, is called the rattle-snake fern, from its growing in such places as those venomous reptiles frequent.

BOTRYTIS, a genus of fungi, with clusters of minute globular seeds or seed vessels. They grow on rotten herbaceous stems, decaying fungi, living leaves, and similar localities. The muscadine disease which destroys so many silk worms is caused by one species, *B. bassiana*. *B. infectans*, which causes the potato disease, is now removed to the genus *peronospora*.

BOTTA, PAUL EMILE, a French traveler and archæologist, born in Turin, Dec. 6, 1802; was appointed French Consul at Alexandria in 1833. He undertook a journey to Arabia in 1837, described in his "Relation d'un Voyage dans l'Yémen." He discovered the ruins of ancient Nineveh in 1843. He published two important works—one on the cuneiform writing of the Assyrians ("Mé-

moire de l'Écriture Cunéiforme Assyrienne"), and the other upon the monuments of Nineveh ("Monuments de Ninive," 5 vols. folio, with drawings by Flandin, Paris, 1846-1850). He died in Achères, March 29, 1870.

BOTTICELLI, ALESSANDRO (bot-ti-chel'lē), a Florentine artist, born in 1440. He studied painting under Lippi, whose manner he successfully imitated, and was one of the earliest engravers, having learned the art from Baldini, and applied it to the illustration of Dante's works, printed in 1488. Two pictures of his, "Venus Rising from the Sea," and "Venus Adorned by the Graces," are highly spoken of. He died in 1515.

BOTTLE, a vessel with a relatively small neck adapted to hold liquids. The first bottles were of leather (Josh. ix: 4). Such leathern bottles are mentioned by Homer, Herodotus and Vergil, as being in use among the Greeks, Egyptians and Romans, as they still are in Spain, Sicily, Africa, and the East. Earthenware bottles followed (Jer. xiii: 12); these are generally furnished with handles, and are called flasks. Modern bottles are chiefly of glass, and glass bottles have been found at Pompeii.

BOTTLE GOURD, a gourd, *lagenaria vulgaris*, called also the white pumpkin. The Hindus cultivated it largely as an article of food. There are several varieties. One is the sweet bottle gourd; another is used as a buoy in swimming across Indian rivers, transporting baggage, etc.

BOTTLE NOSE, a cetacean, the bottle nosed whale (*hyperoödon bidens*), very destructive to food fishes, and of comparatively little economic value itself. It is the prime aversion of fishermen.

BOTTLE TREE (*delabechea rupestrис*), a tree of northeastern Australia, order *sterculiaceæ*, with a stem that bulges out into a huge, rounded mass. It abounds in a nutritious mucilaginous substance.

BOTTOMRY, a contract by which the owner of a vessel borrows money on the security of the bottom or keel, by which, a part being put for the whole, is meant the ship itself. If the ship is lost the lender loses all his money. If, on the contrary, it returns in safety, he receives back the principal, with interest at any rate which may be agreed upon between the parties, and this was allowed to be the case even when the usury laws were in force. Bottomry is sometimes corrupted into bummaree.

BOUCHER, FRANCOIS (bö-chä'), a French painter, was born in Paris, Sept. 29, 1703; studied at Rome, and became a member of the Academy (1734), and painter to Louis XV. (1765). He was an artist of much ability, and equally facile in the production of figure or landscape pictures. The number of his pictures and drawings is said to have exceeded 10,000; he also executed engravings. At his death, May 30, 1770, he was Director of the French Academy.

BOUCHER DE CRÈVECEUR DE PERTHES, JACQUES (bö-shä de krävker de pär'), a French anthropologist and writer, born in Réthel, Sept. 10, 1788. Through his father, an active botanist, he came under the notice of Napoleon, and was employed in numerous missions to Italy, Germany, Austria, and Hungary. From the Restoration he lived at Abbeville and there he died, Aug. 5, 1868. Only his works on the archaeology of man are of consequence now. The first, "On the Creation" (5 vols., 1839-1841), already brought him some reputation, but his long investigations on stone weapons and other remains of early human civilization in the Tertiary and older Quaternary Diluvial strata made him famous. Other works of great value are "Celtic and Antediluvian Antiquities" (3 vols., 1846-1865), and "Antediluvian Man and His Works" (1860).

BOUCHES-DU-RHÔNE (bösh-dü-rōn; "Mouths of the Rhône"), a department of the S. of France, in ancient Provence. Chief town, Marseilles. Area, 1,971 square miles. The Rhone is the principal river. The climate is generally very warm; but the department is liable to the *mistral*, a cold and violent N. E wind from the Cevennes ranges. Much of the soil is unfruitful, but the fine climate makes the cultivation of figs, olives, nuts, almonds, etc., very successful. The manufactures are principally soap, brandy, olive oil, chemicals, vinegar, scent, leather, glass, etc. The fisheries are numerous and productive. Pop. about 806,000.

BOUCICAULT, DION (bö-së-kö'), a dramatic author and actor, born in Dublin, Dec. 26, 1822; educated at London University. He produced his first dramatic work, "London Assurance," before he was 19 years old. Its great success determined his career in life. Once embarked in the profession of a play writer, Boucicault produced piece after piece in rapid succession. "Old Heads and Young Hearts," "Love in a Maze," "Used Up," "Louis XI." "The Corsican Brothers," "The Streets of London."

"Flying Scud," "After Dark," "The Shaughraun," "Kerry," and "Colleen Bawn" are the most popular of his works. As a comedian, especially in his own plays, he was highly successful. From 1853 to 1860 he was in the United States, where his popularity was scarcely less than it had been in England. He died in New York City, Sept. 18, 1890.

BOUDINOT, ELIAS (bö-di-not), a distinguished American patriot and philanthropist, born in Philadelphia, May 2, 1740; was President of the Continental Congress (1782), and first President of the American Bible Society (1816-1821). He wrote "The Second Advent of the Messiah," "The Age of Revelation," a reply to Thomas Paine, "The Star in the West," an attempt to identify the American Indians with the Ten Lost Tribes of Israel. He died in Burlington, N. J., Oct. 24, 1821.

BOUGAINVILLE, LOUIS ANTOINE DE (bö-gan-vé'l), a French navigator, born in Paris, Nov. 11, 1729. At first a lawyer, he afterward entered the army and fought bravely in Canada, under the Marquis of Montcalm, and it was principally owing to his exertions, in 1758, that a body of 5,000 French withstood successfully a British army of 16,000 men. After the battle of Sept. 13, 1759, in which Montcalm was killed and the fate of the colony decided, Bougainville returned to France and served with distinction in the campaign of 1761, in Germany. After the peace he entered the navy, and became a distinguished naval officer. In 1763 he undertook the command of a colonizing expedition to the Falkland Islands, but as the Spaniards had a prior claim the project was abandoned. Bougainville then made a voyage round the world, which enriched geography with a number of new discoveries. In the American War of Independence he distinguished himself at sea, but withdrew from the service after the Revolution. He died in Paris, April 31, 1811.

BOUGAINVILLE ISLAND, an island in the Pacific Ocean, belonging to the Solomon group (area, 4,000 square miles). It is separated from Choiseul Island by Bougainville Strait.

BOUGAINVILLÆA (from Bougainville, the French navigator), a genus of *nyctaginaceæ* (*nyctagos*). They are natives of the tropics and sub-tropics of both hemispheres, although they have been transplanted to hothouses and gardens in the milder temperate climates.

BOUGHTON, GEORGE HENRY, an English-American landscape and *genre* painter, born near Norwich, England, in

1834. His parents came to the United States in 1839, and settled in Albany. He studied art without a master, and, in 1853, went to London and Paris to continue his studies. Since 1861, he has resided in London. His best pictures are "The Idyl of the Birds," "The Scarlet Letter," "Puritans Going to Church," and "The Return of the May Flowers." He was a National Academician, and an Associate of the Royal Academy. He died Jan. 19, 1905.

BOUGIE (bö-zhē), a port of Algeria, on the Bay of Bougie, 120 miles E. of Algiers. Bougie was the Saldae of the Romans, and, in the 5th century, was a chief seat of the Vandals; under the Arabs it was raised to such importance that it was called Little Mecca, and was the *entrepôt* of the trade between Christendom and north Africa; but after various vicissitudes, it had sunk to a small village in 1833, when the French captured the place. Their extensive works have since rendered it a strong fortress, and a commercial center of some value. Pop. about 19,000.

BOUGIE, a smooth, flexible, elastic, slender cylinder, designed to be introduced into the urethra, rectum or oesophagus, in order to open or dilate it in cases of stricture or other diseases. It is formed either solid or hollow, and is sometimes medicated. An armed bougie is one with a piece of caustic fixed at its extremity. When an instrument such as is described *supra* is made of metal and is inflexible it is called a catheter or sound—the former if hollow and the latter if solid.

BOUGUEREAU, WILLIAM ADOLPHE (bög-rō'), a French painter, born in La Rochelle, Nov. 30, 1825. After a youth of hardship courageously endured he succeeded in reaching Paris, where he was educated at the studio of Picot, and at the Beaux Arts. In 1850 he gained the Prix de Rome, and went to Italy to study. His first great success was "The Body of St. Cecilia Borne to the Catacombs" in the Salon of 1854. He painted portraits occasionally, but his subjects are chiefly ideal, idyllic and religious. He was a thorough draftsman, and excelled in the painting of flesh. He died Aug. 20, 1905.

BOUILLET (bö-yā'), **FRANÇOIS CLAUDE AMOUR, MARQUIS DE**, a French general, born in Cluzel, Nov. 19, 1739; entered the army at the age of 14 and served with distinction in Germany during the Seven Years' War. In 1768 he was appointed governor of the island

of Guadeloupe, and afterward commander-in-chief of all the French forces in the West Indies. When war broke out in 1778, he successively took from the British, Dominica, Tobago, St. Eustache, Saba, St. Martin, St. Christopher's, and Nevis. Louis XVI. nominated him a member of the Assembly of Notables in 1787-1788; in 1790 he was made commander-in-chief of the army of the Meuse, the Saar, and the Moselle. For his share in the attempted escape of Louis XVI. he had to flee from France. In 1791 he entered into the service of Gustavus III., of Sweden, and afterward served in the corps of the Prince of Condé. He rejected a proposal, made in 1793, that he should take the chief command in La Vendée; and went to England, where he wrote his *Mémoires sur la Révolution Française*. He died in London, Nov. 14, 1800.

BOUILLOON (bö-yōn), originally a German duchy, now a district in Belgium, 9 miles wide and 18 long, on the border of Luxembourg, a woody and mountainous tract. Pop. about 23,000. The small town of Bouillon was once the capital of the duchy, which belonged to the famous Crusader, Godfrey of Bouillon.

BOULAK, a town of Lower Egypt, a suburb and port of Cairo. It has cotton, sugar, and paper factories. Pop. 10,000.

BOULANGER, GEORGES ERNEST JEAN MARIE (bö-län-zhā'), a French soldier, born in Rennes, April 29, 1837. After a successful career in Algeria and in the East he became Minister of War in 1866. He introduced many needful reforms, insisted on the adoption of a repeating rifle and caused important experiments to be made with high explosives. In the ministerial crisis of 1887 he lost his portfolio, and was appointed to the command of the 13th Army Corps, but was retired March 28, 1888. In January, 1889, he was elected Deputy to the National Assembly by 81,000 majority, in consequence of which the Floquet ministry resigned. In August, 1889, he was charged with embezzlement, treason and conspiracy, and found guilty by the Senate. He killed himself in Brussels, Sept. 30, 1891.

BOULDER, city and county-seat of Boulder co., Col., on Boulder Creek and the Union Pacific and other railroads; 29 miles N. W. of Denver, the State capital. It is in a noted gold, silver, and coal mining and an agricultural and stock raising region, at the E. base of the Rocky Mountains. It received a city

charter in 1882; is the seat of the State University; and has National banks, and daily and weekly periodicals. The famous Boulder canon is a local object of wide interest to the tourist. Pop. (1910) 9,539; (1920) 11,006.

BOULDER, a large, rounded block of stone, which, whether lying loose on the surface of the ground or imbedded in the soil, is of different composition from the rocks adjacent to which it now rests, and must, therefore, have been transported from a lesser or greater distance. From the last mentioned facts, boulders are often called erratic blocks or simply erratics.

BOULDER CLAY, a clay stratified or unstratified, belonging to the boulder formation.

BOULEVARD (bö-lväär), a French word formerly applied to the ramparts of a fortified town, but when these were leveled, and the whole planted with trees and laid out as promenades, the name boulevard was still retained. Modern usage applies it also to many streets, which are broad and planted with trees, although they were not originally ramparts. The most famous boulevards are those of Paris.

BOULOGNE (bö-lon-ye or bö-lön), or **BOULOGNE-SUR-MER**, a fortified seaport of France, department of Pas de Calais, at the mouth of the Liane. It consists of the upper and lower town. The former is surrounded with lofty walls, and has well-planted ramparts; the latter, which is the business part of the town, has straight and well-built streets, and is semi-English in character, many of the sign-boards being in English. Boulogne was one of the chief British depots in France during the World War. In the castle, which dates from 1231, Louis Napoleon was imprisoned in 1840. Boulogne has manufactures of soap, earthenware, linen and woolen cloths; wines, coal, corn, butter, fish, linen and woolen stuffs, etc., are the articles of export. Napoleon, after deepening and fortifying the harbor, encamped 180,000 men here with the intention of invading England at a favorable moment. Pop. about 53,000.

BOULOGNE, a village of France, department of the Seine, between the Seine and the wood of the same name (the well known Bois de Boulogne), 4 miles W. of Paris, and forming a suburb of the French metropolis. The adjoining Bois is, in the summer season, the favorite promenade of the Parisian fashionables. The Château de Madrid,

in this wood, built by Francis I., was demolished in the reign of Louis XVI.; and only a small part now remains of the Château de la Muette, some time occupied by Louis XV. Pop. about 57,000.

BOUND BROOK, a borough of New Jersey in Somerset co. It is on the Baltimore and Ohio, the Central of New Jersey, the Lehigh Valley, and the Philadelphia and Reading railroads, and on the Raritan river and the Delaware and Raritan canal. It is an important industrial community and has manufactures of moving-picture films, woolen goods, engines, asbestos products, paint, and lumber. There is a public library, a hospital, and other public buildings. Pop. (1910) 3,970; (1920) 5,906.

BOUNTY, a grant or benefaction from the Government to those whose services directly or indirectly benefit it, and to whom, therefore, it desires to accord some recompense, or at least recognition. In law and commerce, it is a premium paid by a government to the producers, exporters or importers of certain articles, or to those who employ ships in certain trades. This is done either with the view of fostering a new trade during its infancy, or of protecting an old one which is supposed to be of special importance to the country. In 1890, Congress passed an act providing for a premium to be paid to the producers of cane, beet, and sorghum sugar by way of bounty. This act greatly stimulated the sugar-producing industry of the country.

BOUNTY JUMPER, a term used during the Civil War in the United States to denote one who enlisted in the United States military service to secure the bounty paid by the Government for volunteers, and then deserted.

BOURBON (bör-bôn'), an ancient French family which has given three dynasties to Europe, the Bourbons of France, Spain, and Naples. The first of the line known in history is ADHEMAR, who, at the beginning of the 10th century, was Lord of the Bourbonnais (now the department of Allier). The power and possessions of the family increased steadily through a long series of Archambauds of Bourbon, till, in 1272, BEATRIX, daughter of Agnes of Bourbon and John of Burgundy, married Robert, sixth son of Louis IX. of France, and thus connected the Bourbons with the royal line of the Capets. Their son, LOUIS, had the barony converted into a dukedom and became the first Duc de Bourbon. Two branches took their or-

igin from the two sons of this Louis, Duke of Bourbon, who died in 1341. The elder line was that of the Dukes of Bourbon, which became extinct at the death of the Constable of Bourbon in 1527, in the assault on the city of Rome. The younger was that of the Counts of La Marche, afterward Counts and Dukes of Vendôme. From these descended ANTHONY of Bourbon, Duke of Vendôme, who, by marriage, acquired the kingdom of Navarre, and whose son, HENRY of Navarre, became Henry IV. of France. Anthony's younger brother, LOUIS, Prince of Condé, was the founder of the line of Condé. There were, therefore, two chief branches of the Bourbons—the royal, and that of Condé. The royal branch was divided by the two sons of Louis XIII., the elder of whom, LOUIS XIV., continued the chief branch, while PHILIP, the younger son, founded the House of Orleans as the first Duke of that name. The kings of the elder French royal line of the House of Bourbon run in this way: HENRY IV., LOUIS XIII., XIV., XV., XVI., XVII., XVIII., and CHARLES X. The last sovereigns of this line, LOUIS XVI., LOUIS XVIII., and CHARLES X. (LOUIS XVIII., son of Louis XVI., never obtained the crown), were brothers, all of them being grandsons of Louis XV. Louis XVIII. had no children, but Charles X. had two sons, viz., LOUIS ANTOINE DE BOURBON, Duke of Angoulême, who was Dauphin till the Revolution of 1830, and died without issue in 1844, and CHARLES FERDINAND, Duke of Berry, who died, Feb. 14, 1820, of a wound given him by a political fanatic. The Duke of Berry had two children, (1) LOUISE MARIE THERESE, called Mademoiselle d'Artois; and (2) HENRI CHARLES FERDINAND MARIE DIEUDONNE, born in 1820, and at first called Duke of Bordeaux, but afterward Count de Chambord, who was looked upon by his party until his death (in 1883) as the legitimate heir to the crown of France.

The branch of the Bourbons known as the House of Orleans was raised to the throne of France by the Revolution of 1830, and deprived of it by that of 1848. It derives its origin from Duke PHILIP I. of Orleans (died 1701), second son of Louis XIII., and only brother of Louis XIV. A regular succession of princes leads up to the notorious EGALITE ORLEANS, who, in 1793, died on the scaffold, and whose son, LOUIS PHILIPPE was King of France from 1830 to the Revolution of 1848. His grandson, LOUIS PHILIPPE, Count de Paris, born Aug. 24, 1838, died in London, Sept. 8, 1894. His son ROBERT, Duke of Orleans, born in

1869, is the present head of the family, and the last male representative of the elder Bourbons, who unites in himself the claims of both branches to the throne of France.

The Spanish-Bourbon dynasty originated when, in 1700, Louis XIV. placed his grandson, PHILIP, Duke of Anjou, on the Spanish throne, who became Philip V. of Spain. From him descends ALPHONSO XIII., born in 1886.

The royal line of Naples, or the Two Sicilies, took its rise, when, in 1735, DON CARLOS, the younger son of Philip V. of Spain, obtained the crown of Sicily and Naples (then attached to the Spanish monarchy), and reigned as Charles III. In 1759, however, he succeeded his brother, FERDINAND VI., on the Spanish throne, when he transferred the Two Sicilies to his third son, FERDINANDO (Ferdinand IV.), on the express condition that this crown should not be again united with Spain. Ferdinand IV. had to leave Naples in 1806; but, after the fall of Napoleon, he again became King of both Sicilies under the title of Ferdinand I., and the succession remained to his descendants till 1860, when Naples was incorporated into the new kingdom of Italy.

Robert, Duke of Orleans, who, in 1894, became the head of the royal family of France, married, in 1896, the Archduchess Marie Dorothea, daughter of the Archduke Joseph, cousin of the Emperor of Austria. His mother was the Spanish Infanta Louise of Montpensier, and he has one brother and four sisters; the eldest of the latter, Princess Amelie, married the King of Portugal (she died in 1908), and the second, Helena, married the Duke of Aosta, nephew of the King of Italy.

The only uncle of the Duke of Orleans was the Duke de Chartres, born in 1840, who married a daughter of the Prince de Joinville. He died in 1910. A son and a daughter were the issue of this marriage, Princess Marguerite, who in 1896 married the Duke of Magenta, and Prince Jean, Duke de Guise (born in 1874), who married, in 1899, Isabelle, Princess de France. The issue were three daughters and a son. The latter, Prince Henry, was born in 1908.

The granduncles of the Duke of Orleans were: Francis, Prince de Joinville (1818-1900), who married a daughter of Pedro I., Emperor of Brazil, by whom he had a daughter, Françoise (1844-1910), and a son, Pierre, Duke of Penthièvre (1845-1919); Henry, Duke of Aumale (1824-1897); Anthony, Duke of Montpensier (1824-1890), married, in 1846, a sister of Queen Isabella of Spain, and had a daughter, the wife of the

Count of Paris, and a son, Prince Anthony, born in 1866, who married his cousin, the Infanta Eulalie of Spain, in 1886; Louis, Duke of Nemours, born in 1814, died in 1896. He was the father of two daughters and two sons, the eldest son being the Count of Eu, born in 1842, married to a daughter of Pedro II. of Brazil, and, having three children, and the second son being the Duke of Alençon, born in 1844, died 1910, and married to a Bavarian princess (who was burned in the Paris bazaar fire in 1897), and having two children.

By the death of the Count of Chambord, in 1883, the elder line of the Bourbons of France became extinct, and the right of succession merged in the Count of Paris, grandson of King Louis Philippe, representative of the younger, or Orleans, line.

BOURBON, CHARLES, CARDINAL, a French prince and prelate; brother of Antoine de Bourbon, born in 1520; uncle to Henry IV., King of France. He was Archbishop of Rouen, Legate of Avignon, cardinal, peer of France, and member of the Council. In spite of family ties he ardently supported the Guises and the League, and was declared by that faction heir presumptive to the throne on the ground that his brother Antoine, through heresy, had forfeited his claim. On the death of Henry III. he was declared King, as Charles X., and was recognized by a majority of the *parlements*. Yet he was all the while a prisoner at Fontenay-le-Comte, and died there in 1590.

BOURBON, CHARLES, DUKE OF, or CONSTABLE OF BOURBON, son of Gilbert, Count of Montpensier, born in 1489, and, by his marriage with the heiress of the elder Bourbon line, acquired an immense estate. He received from Francis I., in the 26th year of his age, the sword of Constable, and in the war in Italy rendered important services by the victory of Marignano and the capture of Milan. After occupying, for years, the position of the most powerful and highly honored subject in the realm he suddenly fell into disgrace, from what cause is not clearly known. The Constable, embittered by this return for his services, entered into treasonable negotiations with the Emperor Charles V. and the King of England (Henry VIII.), and eventually fled from France to put his sword at the service of the former. He was received with honor by Charles, and, being made general of a division of the Imperial army, contributed greatly to the overwhelming defeat of Francis at Pavia. But the Bourbon found Charles V. false to his promises, and returned,

disappointed and desperate, to the command of his army in Italy, composed mostly of mercenaries, adventurers, and desperadoes from all Europe. Supplies falling short, the Constable formed the daring resolve of leading his soldiers to Rome and paying them with the plunder of the Eternal City. On May 6, 1527, his troops took Rome by storm, and the sacking and plundering continued for months. But the Bourbon himself was shot at the head of his soldiers. He was but 38 years of age.

BOURBON, LOUIS HENRI, DUC DE, a French courier; Prince of Condé, born in Versailles, in 1692. As Chief of the Council of Regency and superintendent of the King's education, he robbed the public treasury and extorted huge bribes. He was made Prime Minister in 1723, and persecuted the Protestants. He died in Chantilly, Jan. 27, 1740.

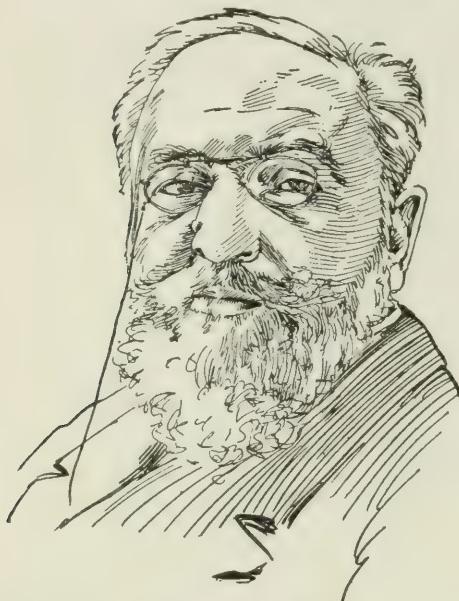
BOURBON WHISKY, a term applied to Kentucky whisky, made from a mixture of corn, rye, and malt. In its distillation some of the oils and acids are allowed to remain. These, with age, undergo chemical action, and are converted into aromatic ethers.

BOURDALOU, LOUIS (bör-dä-lö'), a Jesuit, and one of the greatest preachers France ever produced, was born in 1632. The extreme popularity of his sermons induced his superiors to call him to Paris where at their Church of St. Louis, his eloquence attracted crowds, and he became the favorite preacher of Louis XIV., who, on the revocation of the Edict of Nantes, sent him into Languedoc to convert the Protestants. Toward the latter part of his life he rarely ascended the pulpit, and devoted himself to attending the sick, visiting the prisons and other works of charity; and died in 1704 universally lamented.

BOURGEOIS, a size of printing type larger than brevier and smaller than long primer, used in books and newspapers; now supplanted by 9-point type.

BOURGEOIS, LÉON VICTOR AUGUSTE, a French statesman, born in Paris in 1851. He received a careful education at the Lycée Charlemagne and was destined for the law, which profession he followed for some time, though his inclinations drew him more and more into the domain of politics. He rose step by step from minor offices until he became Minister of Public Instruction in the French Cabinet, 1890-1892. Following this, he held a place in many cabinets and was Premier, 1895-1896. In political life he has been a radical by conviction, but has shown great talent in

conciliating diverse elements, so that he has occupied in French public life a rôle very similar to that of Henry Clay, "The Great Compromiser," in our own national history. He was a delegate to the Hague Conference, and it was the talent



LÉON V. A. BOURGEOIS

shown and the experience gained in this connection that caused him to be chosen to preside in 1920 at the first session of the League of Nations. As one of the French delegates to the Peace Conference, he took a leading part in the discussions, and was a very influential figure.

BOURGEOISIE (börzh-wä-zé'), a name applied to a certain class in France, in contradistinction to the nobility and clergy as well as to the working classes. It thus includes all those who do not belong to the nobility or clergy, and yet occupy an independent position, from financiers and heads of great mercantile establishments at the one end to master tradesmen at the other. It corresponds pretty nearly with the English term middle classes. Etymologically, the word refers to the old class of freemen or burgesses residing in towns. The word became generally employed by the Bolshevik workers in Russia to designate all classes aside from manual workers, especially those who possessed property. Thousands of this class were killed or deprived of their possessions in 1917-1921.

BOURGES, an ancient city of France, capital of the department of Cher, at the confluence of the Auron and Yèvre, 124 miles S. of Paris, formerly surrounded with ramparts, now laid out as promenades. It has crooked and gloomy streets, and houses built in the old style. The most noteworthy building is the cathedral (an archbishop's) of the 13th century, and one of the finest examples of Gothic in France. Bourges is a military center and has an arsenal, cannon foundry, manufactures of cloth, leather, etc. Pop. about 45,000.

BOURGET, PAUL (börzh-há') a French novelist, born in Amiens, Sept. 2, 1852. After a brilliant course at the Lyceum of Clermont-Ferrand and the College of Sainte Barbe, he graduated with high honors in 1872. He began to write in 1873. He published three volumes of striking verse, "La Vie Inquiète" (1875); "Edel" (1878); and "Les Aveux" (1881). His "Essais" (1883) was the first indication of his strength. The second series, "Nouveaux Essais de Psychologie contemporaine" (1886), increased his reputation. Bourget's first novel, "L'Irréparable" (1884), was followed by "Cruelle Enigme" (1885); "Un Crime d'Amour" (1886); "André Cornélis" (1887), and "Mensonges" (1887). These works gave him first rank among contemporary French authors. His intimate knowledge of English and Italian life, and his travels in Spain and Morocco, gave him the materials for "Sensations d'Italie" (1891), and "Cosmopolis" (1892), and he recorded his impressions (1894) of travel in the United States. Other novels are "Le Disciple," "Notre Coeur," "La Terre Promise," "Un Saint," "Antigone," "L'envers du décor" (1911); "La Crise" (1912). Their author was admitted to the Academy in 1894.

BOURMONT (bör-môn'), LOUIS AUGUSTE VICTOR DE GHASNE, COMTE DE, Marshal of France, born in Anjou, Sept. 2, 1773. He served as an officer under the Prince of Condé, and, from 1793 to 1796, was actively engaged in the anti-revolutionary struggle in La Vendée. Subsequently, he obtained the favor of the First Consul. In the campaigns of 1813 and 1814, he distinguished himself in the battle of Dresden, and by the defense of Nogent, Napoleon promoted him to the rank of a general of division. On March 31, 1814, he declared for the Bourbons, and received the command of a military division during the first Restoration; yet, on Napoleon's return, he went over to him. His evidence went a considerable way in

bringing about the condemnation and execution of Marshal Ney. He received high military employment under Louis XVIII. Distinguishing himself in the Chamber of Peers as a zealous supporter of the King, he was appointed Minister of War in 1829. When the expedition against Algiers was undertaken in April, 1830, he received the chief command of the troops, and the rapid success of the expedition was ascribed to him. For this he received the Marshal's baton on July 22. The Revolution breaking out, he was superseded in his command, and went to England to share the exile of Charles X. He died in Anjou, Oct. 27, 1846.

BOURNE, EDWARD GAYLORD (börn'), an American educator, born in Strykersville, N. Y., June 24, 1860. He was graduated at Yale in 1883, and has been Professor of History at that institution since 1895, having previously instructed and lectured in history there. He wrote "The History of Surplus Revenue," and was an editor of the "Yale Review." He died Feb. 24, 1908.

BOURNE, HUGH, founder of the sect of Primitive Methodists or Ranters, born in Staffordshire, England, April 3, 1772. In the course of his life he visited Scotland, Ireland, Canada, and the United States, where his ministrations were attended with great success. He died in Bemersy, Oct. 11, 1852.

BOURNE, JONATHAN, American Senator; born at New Bedford, Mass., Feb. 23, 1855. He was educated at Harvard, but left college to go to sea, was shipwrecked at Formosa, and, being rescued, was taken to Portland, Ore., where he has since remained. He was admitted to the bar in 1881, and, after practicing law for a year, became interested in mining and commercial undertakings. He is president of several corporations in Oregon and of the Bourne Cotton Mills, Fall River, Mass. In 1885 he was elected to the State Legislature, and was a member of the Republican National Convention in 1888 and 1892. He was elected to the United States Senate for the term of 1907-1913, but was defeated for re-election in the latter year.

BOURNE, RANDOLPH SILLIMAN, American author; born in Bloomfield, N. J., in 1886. He studied at Columbia University, from which he graduated in 1913. He pursued studies in London and Paris, 1913-1914, and on his return to the United States became a member of the editorial staff of "New Republic" and the "Dial," besides contributing to other magazines. He was an exponent of the

radical school of thought and an able and forceful writer. Among his publications were "Youth and Life" (1913); "The Gary Schools" (1916); and "Education and Living" (1917). He died in 1918.

BOURRIENNE, FAUVELET DE (bör-yen'), a French diplomatist, born in 1769, and educated along with Bonaparte at the School of Brienne, where a close intimacy sprang up between them. Bourrienne went to Germany to study law and languages, but, returning to Paris in 1792, renewed his friendship with Napoleon, from whom he obtained various appointments, and, latterly, that of minister plenipotentiary at Hamburg. His character suffered from his being involved in several dishonorable monetary transactions, but he continued to fill high state offices, and, in 1814, was made prefect of police. On the abdication of Napoleon he paid his court to Louis XVIII., and was nominated a Minister of State. The Revolution of July, 1830, and the loss of his wealth, deprived him of his reason. He died in a lunatic asylum in 1834. His "Mémoires sur Napoléon, le Directoire, le Consulat, l'Empire et la Restauration" are valuable.

BOURSE, an exchange where merchants, bankers, etc., meet for the transaction of financial business. It is used especially of the Stock Exchange of Paris. In the United States the great exchange in Philadelphia is styled the Bourse.

BOUSSA (bö's'a), or **BUSSANG**, a city of Africa, in the Sudan, on the Niger, near where are rapids; about lat. $10^{\circ} 40'$ N. It was here that Mungo Park met his death in 1805. Pop. est. between 15,000 and 20,000.

BOUTWELL, GEORGE SEWELL, an American statesman, born in Brookline, Mass., Jan. 23, 1818; was admitted to the bar in 1836; served in the State Legislature in 1842-1851; Governor of Massachusetts in 1851-1852; was an organizer of the Republican party in 1854; appointed the first commissioner of the newly established Department of Internal Revenue in 1862; a Representative in Congress in 1863-1869; one of the managers of the impeachment trial of President Johnson; Secretary of the Treasury in 1869-1873; and a United States Senator in 1873-1879. Besides numerous speeches he published "Educational Topics and Institutions" (1859); several works concerning taxation, and "The Constitution of the United States at the End of the First Century" (1895). He died Feb. 28, 1905.

BOVIDÆ, a family of ruminating animals, containing not merely the oxen, but many other animals now placed in other families. It was subdivided into *bovina*, *cervina*, *giraffina*, *moschina*, and *camelina*; also, a family of ruminating animals, consisting of species with simply rounded horns, which are not twisted in a spiral manner. There are no lachrymal sinuses. It contains the genera *bos*, *bison*, *bubalus*, etc. *Ovibos* (musk ox), generally ranked under *bovidæ*, is by some placed with the *ovidæ*. The oldest known are various species of *bos*, *hemibos*, and *amphibos* in the Upper Miocene of India. The genera *bos* and *bison* are found in the Pliocene.

BOW, the name of one of the most ancient and universal weapons of offense. It is made of steel, wood, horn, or other elastic substance. The figure of the bow is nearly the same in all countries. The ancient Grecian bow was somewhat in the form of the letter E: in drawing it, the hand was brought back to the right breast, and not to the ear. The Scythian bow was nearly semicircular. The long bow was the favorite national weapon in England. The battles of Crecy (1346), Poictiers (1356), and Agincourt (1415) were won by this weapon. It was made of yew, ash, etc., of the height of the archer, or about six feet long, the arrow being usually half the length of the bow. The arbalist, or cross bow, was a popular weapon with the Italians, and was introduced into England in the 18th century.

BOW, in music, an appliance with which the strings of certain musical instruments of the viol class are set in vibration. It consists of a number of long horse hairs stretched upon an elastic rod, which are tightened by a nut and screw. It was originally curved, whence its name. The old form is still seen in the rebeck or rebab of Algeria.

BOW BELLS, the peal of bells belonging to the Church of St. Mary-le-Bow, Cheapside, London, and celebrated for centuries. One who is born within the sound of Bow Bells is considered a genuine cockney.

BOWDITCH, HENRY PICKERING, an American educator, born in Boston, Mass., April 4, 1840; was graduated at Harvard in 1861, and subsequently studied chemistry and medicine, and, after the Civil War, in which he reached the rank of major in the Union service, he took a special course in physiology in France and Germany. In 1871-1876 he was Assistant Professor of Physiology in

the Harvard Medical School, and in 1876 was elected to the full chair. Resigned in 1906. A member of the American Academy of Arts and Sciences, as well as of numerous medical societies.

BOWDITCH, NATHANIEL, an American mathematician, born in Salem, Mass., March 26, 1773; published, in 1802, the "American Practical Navigator," a work of the highest value and utility. In 1814-1817, appeared his translation of the "Mécanique Céleste" of Laplace, with an able commentary—a work which obtained for him admission as a Fellow to the Royal Society of London. He died in Boston, March 16, 1838.

BOWDOIN, JAMES, an American patriot, born in Boston, Aug. 8, 1727. He was prominent in Massachusetts during the Revolution. He became governor of his State in 1785, and, in the following year, suppressed Shay's rebellion. Bowdoin College was named after him. He died in Boston, Nov. 6, 1790.

BOWDOIN COLLEGE, an institution for higher education in Brunswick, Me.; organized in 1794 under the auspices of the Congregational Church; reported at the end of 1919: Professors and instructors, 29; students, 448; volumes in the library, 120,000; productive funds, \$2,631,012; income, \$137,137; president, Kenneth C. M. Sills.

BOWELS. See ABDOMEN: DIARRHEA: INTESTINES.

BOWEN, HENRY CHANDLER, an American editor and publisher, born in Woodstock, Conn., Sept. 11, 1813. He received a common school education and entered business. In 1848 he helped found "The Independent" in New York, becoming, in 1861, its editor and proprietor, and making the paper famous for its advanced views on public topics. He died in Brooklyn, N. Y., Feb. 24, 1896.

BOWEN, HERBERT WOLCOTT, an American diplomat, born in Brooklyn, N. Y., Feb. 29, 1856. He was educated at Yale and the Columbia Law School. He took an active part in Republican politics and was consul-general at Barcelona when the Spanish-American war broke out. In 1901 he was made Minister to Persia. He later served as Minister to Venezuela, but retired in 1905. He has published "Losing Ground," "In Divers Tones," "De Genere Humano," and "International Law."

OWERBANKIA (from J. S. Bowerbank, an eminent naturalist, who flourished in the middle of the 19th century), a genus of *ascidioid polyzoa*, belonging

to the family *vesiculariidae*. *B. imbricata* is found abundantly on the chains of vessels.

BOWER BIRDS, the name given to certain birds of the genera *ptilonorhynchus* and *chlamydotis*, which are ranked under the family *sturnidae* (starlings). They are found in Australia. The English name is given because these birds are in the habit of building bowers as well as nests. The best known species is *ptilonorhynchus holosericeus*.

BOWERY, THE, a New York street. It begins at Chatham Square and terminates at Cooper Union. It was long famous for the resorts located along its length, but now resembles any other populous city street.

BOWIE, JAMES, an American frontiersman, born in Burke co., Ga., about 1790. He took part in the revolt of Texas against Mexico, and fell in the Alamo massacre, March 6, 1836. He gave his name to the bowie knife.

BOWLES, FRANCIS TIFFANY, an American naval constructor, born in Springfield, Mass., Oct. 7, 1858. He was graduated at the United States Naval Academy in 1879, and has ever since been prominent in the work of naval construction, with special reference to the rehabilitated United States navy. He was chief constructor of the navy (1901-1903), and then engaged in shipbuilding in Massachusetts. Member of the London Society of Naval Architects.

BOWLES, SAMUEL, an American journalist, born in Springfield, Mass., Feb. 9, 1826. He was editor and proprietor of the Springfield "Republican" and a prominent factor in public affairs. He wrote "Across the Continent" and "The Switzerland of America." He died at Springfield, Mass., Jan. 16, 1878.

BOWLING GREEN, a city of Kentucky, the county-seat of Warren co. It is on the Louisville and Nashville railroad and on the Barren river. The city is the center of an important agricultural region producing grain, vegetables, and tobacco. It also has important trade in live-stock and horses. The city has two handsome parks. It is the seat of the Western Kentucky Normal School, Columbia's Academy, and other educational institutions. Pop. (1910) 9,173; (1920) 9,638.

BOWLS, an ancient British game, still extremely popular. It is played on a smooth, level piece of greensward, generally about 40 yards long, and surrounded by a trench or ditch about six

inches in depth. A small white ball called the jack is placed at one end of the green, and the object of the players, who range themselves in sides at the other, is so to roll their bowls that they may lie as near as possible to the jack. Each bowl is biased by being made slightly conical so as to take a curvilinear direction; and, in making the proper allowance for this bias, and so regulating the cast of the ball, consist the skill and attraction of the game. The side which owns the greatest number of bowls next the jack, each bowl so placed constituting a point, carries off the victory.

BOWRING, SIR JOHN, an English linguist, author and diplomat, born in Exeter, Oct. 17, 1792; was a great traveler and a close student; and boasted that he knew 200 languages and could speak 100. In 1825 he became editor of the "Westminster Review," in which he advocated free trade by repeal of the Corn Laws in advance of Bright and Cobden. He was a member of Parliament in 1835-1837 and 1841-1847; was appointed on various commissions, to France, Switzerland, Italy, Syria, etc. In 1849 he was British consul at Hong-Kong, where he became governor in 1853. He was knighted in 1854. Among his works are "Specimens of the Russian Poets" (London, 1821-1823); "Ancient Poetry and Romances of Spain" (1824); "Specimens of the Polish Poets" (1827); "Serbian Popular Poetry" (1827); "Poetry of the Magyars" (1830); "The Flowery Scroll: a Chinese Novel" (1868); and two important volumes of travel, "The Kingdom and People of Siam" (1857), and "A Visit to the Philippine Islands" (1859). He edited, with a biography (22 vols., London, 1838), the works of Jeremy Bentham. He was also the author of some well known hymns. He died in Exeter, Nov. 23, 1872.

BOWSPRIT, a spar projecting forward from the bows of a vessel. It supports the jibboom and flying jibboom, and to the bowsprit and these spars the fore-stay, foretopmast stay, etc., are secured. It is tied down by the bobstays and by the gammoning. It is stayed laterally by the bowsprit shrouds. It rests upon the stem and the apron. The part which rests on the stem is the bed; the inner part from that point is the housing; the inner end is the heel; the outer end the head or bees seating. The gammoning is the lashing by which the bowsprit is secured to the knee of the head. The martingale is a spar depending from the bowsprit end, and is used for reeving the stays. The heel chain is for holding out the jibboom, and the crupper chain for

lashing it down to the bowsprit. The bowsprit has heel, head, fiddle or bees, chock, gammoning, bobstays, shrouds, martingale, and dolphin striker. Bow-sprits are standing, that is, permanent, as in large vessels or sloops; or running-in bowsprits, as in cutters.

BOWSTRING HEMP (so called because the fibers of the leaves are used for bowstrings by the natives of the country where they grow), an English name for *sansevieria*, a genus of *liliaceæ*. It is called also African hemp. The species are stemless perennials, with whitish or yellowish green clusters of flowers. They are found in Africa and southern Asia. *Sansevieria roxburghiana* is the moorva or marvel of India, the fibers of which are used in the manufacture of string.

BOX, the English name of *buxus*, a genus of plants belonging to the order *euphorbiaceæ* (spurgeworts). The common boxtree is *buxus sempervirens*. In its wild state it is a small tree. It is found all over the world in some form of species. It is an evergreen. A dwarf variety of the box is used as an edging along walkways in gardens.

BOX ELDER, the English name of *negundo*, a genus of plants belonging to the order *aceraceæ* (maples). It resembles *acer*, but has pinnate leaves. The ash-leaved box elder, *negundo americanum*, rises to the height of 35 feet, and is an ornamental tree.

BOXERS, members of a Chinese secret society which aimed ostensibly at the expulsion of foreigners from China. The native name for the organization is *I-ho-ch'uan*, usually rendered "Combination of Righteous Harmony Fists," and the like. An uprising of the Boxers in 1900 led to international intervention in China, in order to rescue members of the foreign legations besieged in Pekin. See CHINA.

BOXING. See PUGILISM.

BOXING THE COMPASS, in seamen's phrase, the repetition of all the points of the compass in their proper order—an accomplishment required to be attained by all sailors.

BOX THORN, a genus of *solanaceæ* (night-shades). They are ornamental plants. The willow-leaved species, *lycium barbarum*, so called because it comes from Barbary, is valuable for covering naked walls or arbors. The European box thorn, *L. europaeum*, which is spiny, is used as a hedge plant in Tuscany. The small shoots are said to be eaten in Spain with oil and vinegar.

BOX TORTOISE, a name given to one or two North American tortoises, genus *cistudo*, that can completely shut themselves into their shell.

BOYACÁ; a department of Colombia, touching Venezuela. In the W. it is mountainous; in the E. it has vast prairies, and is watered by the Meta and its tributaries. The Muzo emerald mine is the richest in the world, and the department is rich in salt springs, coal, iron, plumbago, and copper ore. Area 33,293 square miles; pop. about 580,000. Capital, Tunja.

BOYCE, WILLIAM, an English composer, born in London in 1710; was a chorister at St. Paul's, and was appointed composer to the Chapel Royal, in 1736, and organist in 1758. He received the degree of Doctor of Music from Cambridge in 1749, and was master of the King's band from 1755. Boyce holds a high rank as a composer of church music. His songs include "Hearts of Oak," written for one of Garrick's pantomimes. His best work is the serenata of "Solomon" (1743); his most valuable publication is a collection of the "Cathedral Music" of the two preceding centuries (3 vols., 1760). He died in Kensington, Feb. 7, 1779.

BOYCOTTING, a practice which owes its name to Capt. C. C. Boycott (died June 21, 1897), of Lough Mask House, in Mayo, Ireland, and agent, in 1880, of Lord Erne, an Irish nobleman. The former gentleman having given offense about agrarian matters to the people among whom he lived, during the land agitation of 1880-1881, no one would gather in his crops. The case being reported in the "Press," about 60 Orangemen, belonging to the north of Ireland, organized themselves into a "Boycott relief expedition." The Government gave them a strong escort of cavalry, besides foot soldiers and constabulary, artillery also being added on the return journey. The crops were gathered in and sent away, and the Captain himself brought off to a region of greater security. The object of a boycott is to put a person outside the pale of the society, amid which he lives, and on which he depends; socially to outlaw him, to refuse to sell to, and decline to buy from, him; to refuse to work for or to employ him.

In the United States and in England the boycott is made use of by trade unionists as a strike measure. It has in some instances been enjoined by the courts. Laws prohibiting boycotting in terms have been enacted in Colorado, Illinois and Wisconsin, and laws which may fairly be construed as prohibiting boycot-

ting have been passed in Alabama, Connecticut, Florida, Georgia, Maine, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, New Hampshire, New York, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Vermont, and Wisconsin. In the following States it is unlawful for any employer to exact an agreement, either written or verbal, from an employee not to join or become a member of any labor organization, as a condition of employment: California, Colorado, Idaho, Indiana, Massachusetts, Minnesota, Missouri, New Jersey, New York, Ohio, and Pennsylvania.

BOYD, THOMAS DUCKETT, an American educator, born in Wytheville, Va., Jan. 20, 1854. He was graduated at Louisiana State University, and has held important posts in the educational institutions of Louisiana. Since 1896 he has been President of Louisiana State University.

BOY-ED, KARL, CAPTAIN, German naval attaché of the German Embassy to the United States, prior to the American declaration of war. His recall was requested of the German Government because his presence in this country was objectionable. The German authorities asked why he was considered undesirable, but the American Government refused to give reasons. The facts were that Boy-Ed was known in some way to have received communications intended by the President for his naval advisers; that he was strongly suspected of having been connected with the issue of false manifests to sailing vessels intended to supply German warships, and of fomenting troubles in munition plants. "An accumulation of incidents" was the way the matter was put in diplomatic phrase. The German Government recalled him Dec. 15, 1915.

BOYESEN, HJALMAR HJORTH (boi'e-sen), an American novelist, born at Frederiksværn, Norway, Sept. 23, 1848. After completing his university studies at Christiania, he came to the United States in 1869 and was editor of a Norwegian journal in Chicago. He returned to Europe in 1872 and studied Germanic Philology at Leipsic two years; then, returning to this country, he was Professor of German in Cornell University, and then of Germanic Languages and Literature in Columbia College till his death. His story of Norwegian life, "Gunnar" (1873), and his "Idyls of Norway and Other Poems" (1883), show fine imagination. He also wrote "Tales from Two Hemispheres" (1875); "A Norseman's Pilgrimage," "Ilka on the

Hilltop, and Other Stories," "A Daughter of the Philistines." He died in New York, Oct. 4, 1895.

BOYLE, RICHARD, "THE GREAT EARL OF CORK," an English statesman, born in Canterbury in 1566. In 1588 he went to Dublin, with strong recommendations to persons in power, whose patronage he obtained. In 1595 he married a lady of fortune, whose death, a few years after, left him the possessor of a considerable income. The state of Ireland at that time made land cheap and he bought Sir Walter Raleigh's estate of 12,000 acres in Cork and Waterford counties. King James I. appointed him Privy Councilor for Munster, and afterward for the Kingdom of Ireland; in 1616 he was made a peer of that realm by the title Baron Boyle of Youghal, and in 1620 he was created Viscount Dungarvan and Earl of Cork. In 1629 he was made one of the Lord Justices of Ireland, and in 1631 Lord Treasurer of that kingdom. He built and fortified towns and castles, and introduced among the people arts and manufactures; but he also put in force the severe laws of Queen Elizabeth against the Roman Catholics. In 1641 the Earl went to England as a witness against Lord Strafford, then under impeachment. Soon after his return home the insurrection of the Irish broke out, on which event he displayed his accustomed activity, enlisting his tenantry under the command of his sons. He died in 1643.

BOYLE, ROBERT, a celebrated natural philosopher, born at Lismore, Ireland, in 1626; was the seventh son of Richard, the first Earl of Cork. After finishing his studies at Eton he traveled for some years on the Continent, till, in 1644, he settled in the manor at Stalbridge, Dorsetshire, which his father had left him. Here he devoted himself to scientific studies, to chemistry and natural philosophy in particular. He was one of the first members of the society founded in 1645, afterward known as the Royal Society. At Oxford, to which he had gone in 1652, he occupied himself in making improvements on the air pump, by means of which he demonstrated the elasticity of air. He began the study of those Oriental languages which contain the origins of Christianity, and formed connections with such eminent scholars as Pococke, Clarke, Barlow, etc. He also instituted public lectures, known as the Boyle Lectures, for proving the Christian religion. The first series was delivered by Richard Bentley. He died in 1691, and was interred in Westminster Abbey.

BOYLE'S LAW, or MARIOTTE'S LAW, a law in physics to the effect that the volume of a gas will vary inversely to the pressure to which it is subjected, the temperature being constant.

BOYNE, a river of Ireland, rises in the Bog of Allen, County Kildare, and flows N. E. through Meath to Drogheda, below which it enters the Irish Sea. It is navigable for barges up to Navan. The Boyne will ever be memorable in English history for the important victory gained on its banks about 3 miles above Drogheda, July 1, 1690, by the forces under the command of William III., over those of James II. Though James' personal courage was beyond all question, he, on this occasion, allowed the prudence of the sovereign to outweigh the impulses of the soldier. Of his troops 1,500 were killed and wounded, while William lost barely 500 men. In 1736 an obelisk, 150 feet high, was erected at Oldbridge, on the site of the battlefield, in commemoration of this victory.

BOY SCOUTS OF AMERICA, an organization designed to help in the preservation of the health and formation of the character of its members. It was incorporated Feb. 8, 1910, and chartered by Act of Congress June 15, 1916. The movement is intended to furnish a wholesome outlet for the activities of young boys by cultivating outdoor sports under wise leadership and at the same time to instil moral principles that will make them upright men and good citizens. It is akin to the Boy Scout movement in Great Britain and in other countries. There is no military object sought to be obtained, and the uniform and drill adopted have their chief value in forming a desirable *esprit de corps*. The ideal of the movement is service—service to others and also to their own highest ideals. Each member subscribes to the following oath: On my honor, I will do my best—1. To do my duty to God and my country and to obey the Scout Law. 2. To help other people at all times. 3. To keep myself physically strong, mentally awake, and morally straight. Scouts are organized into patrols and these again into troops. A patrol consists of eight boys and there are four patrols to a troop. The troop is under a scoutmaster in whose selection much care is exercised, as it is of first importance that he should be in hearty sympathy with youth and yet at the same time be mature and judicious enough to exercise a wise leadership over the growing boys. Each troop, which is usually, though not necessarily, connected with some church or school, must hold a char-

ter from the National Council. The sports and crafts included in the Scout program practically cover the whole range of outdoor life. Fishing, cycling, camping, wood lore, signaling, tracking are some of these. Then, too, the crafts are given much attention. Excellence in photography, gardening, telegraphy, forestry, etc., is stimulated by the award of special medals. The rich and poor are on precisely the same footing and snobbishness is a thing unknown. There are three grades, the Tenderfoot, the Second Class and the First Class. The Scouts pledge themselves to do a good turn daily to some one. The whole aim of the movement is to develop the Boy Scout into a vigorous, chivalric, right living man and loyal citizen of his country.

As an organization, the Scouts have rendered sterling service to the Government during the World War. They were a valuable factor in the Liberty Loan campaigns. They secured subscriptions amounting to \$278,744,650, and sold War Savings Stamps to an amount of \$42,751,000. They co-operated, as far as their youth would allow, with the Red Cross, the War Work and other Government committees; collected 100 carloads of fruit pits for gas masks; distributed 30,000,000 pieces of literature and did a vast amount of related work that released their elders for other tasks. Their patriotism was of the flaming kind, and all they asked was to be told what to do. General Pershing warmly commended their work.

The membership of the organization in the United States in 1919 was 373,174. There were 16,768 troops and the men counsellors, scoutmasters and others connected with the work numbered 102,020. So important a feature of our national life has the work become that courses have been introduced in some of the American universities for training scout leaders. The national headquarters of the organization are in New York.

BOZEMAN, a city of Montana, the county-seat of Gallatin co. It is on the Northern Pacific and the Chicago, Milwaukee and St. Paul railroads, and on the Gallatin river. It is the center of an important mineral region and in the neighborhood are deposits of coal and building stone. Its chief industries are agriculture and stock raising. There are flour mills, lumber mills, and foundries. The city is the seat of the State College of Agriculture and Mechanic Arts, and has a public library and a handsome county and municipal building. Pop. (1910) 5,107; (1920) 6,183.

BOZRAH, an ancient city of Palestine, E. of the Jordan, and about 80 miles S. of Damascus. It was the capital of Og, King of Bashan, and subsequently belonged to the tribe of Manasseh. Early in the Christian era it became a flourishing place, and was long a great emporium of trade. It is now a scene of ruins.

BOZZARIS, MARCOS (*bots-zär'ës*), a Greek patriot, born in 1789. He was a Suliote, and distinguished himself by his devotion to his country, in defending it against the Turks. He fell in a night attack upon a body of the Turco-Albanian army, who were advancing with the view of taking Missolonghi, which he had successfully defended for a considerable time, Aug. 20, 1823.

BRABANÇONNE (*brab-än-sôn'*), the national song of the Belgians, composed by the French M. Jenneval, and set to music by Campenhout. It was sung by the insurgents during the Revolution of September, 1830. Each verse of the Brabançonne ends with the refrain:

"La mitraille a brise l'orange
Sur l'arbre de la liberté."

It was a favorite marching and fighting song with the Belgian troops in the WORLD WAR (1914-1918).

BRABANT, the central district of the lowlands of Holland and Belgium, extending from the Waal to the sources of the Dyle, and from the Meuse and Limburg plains to the lower Scheldt. It is divided between the Kingdoms of Holland and Belgium. Total population Belgian Brabant about 1,523,000. The country is generally a plain, gently sloping to the N. W., and is mostly fertile and well cultivated, agriculture and the rearing of cattle being the principal employment of the inhabitants. In the N. the inhabitants are Dutch; in the middle district, Flemings; in the S., Walloons. Southward of Brussels the language is French; northward, Dutch and Flemish. In the 5th century Brabant came into possession of the Franks, and, after being alternately included in and separated from Lorraine it emerged at length in 1190 as a duchy under a Duke of Brabant. It eventually came by marriage into possession of the Dukes of Burgundy, and passed with the last representative of that line, Mary of Burgundy, to the House of Austria, and finally to Philip II. of Spain. In the famous revolt of the Netherlands, caused by the cruelties of King Philip and his agent, the Duke of Alva, North Brabant succeeded in asserting its in-

dependence, and, in 1648, it was incorporated with the United Provinces. South Brabant remained, however, in possession of the Spaniards, and at the Peace of Utrecht, in 1714, passed again, along with the other S. provinces of the Netherlands, to the imperial House of Austria.

BRACE, CHARLES LORING, an American author and philanthropist, born in Litchfield, Conn., Jan. 19, 1826. He graduated at Yale in 1846, and studied theology, but held no pastorate. He devoted himself to philanthropy in New York, and lectured, wrote, and worked to enlist aid for the children of the poor. His books include "Hungary in 1851" (New York 1852); "Home Life in Germany" (1853); "The Norse Folk" (1857); "The Dangerous Classes of New York and Twenty Years' Work Among Them" (1872, 3d ed., 1880); "Gesta Christi" (1883); "To the Unknown God" (1889). He died in 1890.

BRACELET, a kind of ornament usually worn on the wrist, the use of which extends from the most ancient times down to the present, and belongs to all countries, civilized as well as uncivilized. Bracelets were in use in Egypt and among the Medes and Persians at a very remote period, and in the Bible the bracelet is frequently mentioned as an ornament in use among the Jews, both men and women. Among the ancient Greeks bracelets seem to have been worn only by the women. Among the Romans it was a frequent practice for a general to bestow bracelets on soldiers who had distinguished themselves by their valor. Roman ladies of high rank frequently wore them both on the wrist and on the upper arm. Among the ancient heathen Germanic tribes they formed the chief and almost only ornament.

BRACHIOPODA, animals with arm-like feet; one of the great classes into which the molluscan sub-kingdom of the animal kingdom is divided. The brachiopoda are bivalves, with one shell on the back of the animal, and the other in front; these are called dorsal and ventral valves. The two valves are never equal in size. They differ from the conchifera (called also *lamelli branchiata*), or ordinary bivalves, in uniformly having one side of the same valve symmetrical with the other. The organization of the brachiopoda is inferior to that of the true bivalves. They are attached to bodies by a pedicle which passes as the wick does in an antique lamp, whence the older naturalists called them lamp shells. The shell is lined by an expansion of the integument or mantle. They are all marine,

occurring chiefly in the deep sea. The families are: (1) *Terebratulidæ*, (2) *spiriferidæ*, (3) *rhynchonellidæ*, (4) *or-thidæ*, (5) *productidæ*, (6) *craniadæ*, (7) *discinidæ*, and (8) *lingulidæ*.

BRACHYTERÆ (short winged), a name given to a family of web-footed birds, penguins, auks, divers, guillemots, etc., in which the wings are short and the legs placed far back in the body. They are all strong divers and swimmers.

BRACHYURA, a suborder of decapodous crustaceans, containing those families in which the abdomen is converted into a short-jointed tail folding closely under the breast. The common edible crab (*cancer pagurus*) is a familiar example of this structure. The suborder contains four families: (1) *Oxystomata*, (2) *oxyrhyncha* or *maiadæ*, (3) *cyclometopa* or *canceridæ*, and (4) *catometopa* or *ocypodidæ*.

BRACKEN, or **BRAKE**, a species of fern very common in the United States and Europe. It has a black creeping rhizome, with branched pinnate fronds growing to the height often of several feet, and it forms an excellent covert for game. When burned it yields a good deal of alkali. The rhizome of *pteris esculenta*, a native of New Zealand, was formerly a staple article of food among the Maoris.

BRACKET, an ornamental projection from a wall, used for the purpose of supporting a statue, bust, or the like. The term bracket is also employed in joinery, etc., to designate supports, in the form of a bent knee, of shelves, galleries, etc. Bracket is also generally applied to such gaslights as project from the wall.

BRACT, a leaf growing upon the flower stalk. Those which occupy this situation have, as a rule a different size, form, and appearance from the ordinary leaves. The involucle in composite plants, the great spathe in *araceæ*, the palea of grasses, the scales of catkins, etc., are all bracts.

BRACTON, HENRY DE, an English ecclesiastic and jurist, of whom but little certain is known save that he was a "justice itinerant," in 1264 became Archdeacon of Barnstaple and Chancellor of Exeter Cathedral, and died in 1268. He is memorable as one of the earliest writers on English law.

BRADDOCK, a borough of Pennsylvania, in Allegheny co. It is on the Pennsylvania, the Baltimore and Ohio, and the Pittsburgh and Lake Erie rail-

roads, and on the Monongahela river. The city is an important industrial community. It has manufactures of steel, pig iron, steel rails, etc. It has a Carnegie library which is the first established in America, a hospital, Federal building, and a park. The town is the site of Braddock's defeat in 1755. Pop. (1910) 19,257; (1920) 20,879.

BRADDOCK, EDWARD, a British soldier, born in Perthshire, Scotland, about 1695, entered the Coldstream Guards in 1710, and was appointed Major-General in 1754. Nine months later he sailed as commander against



GEN. EDWARD BRADDOCK

the French in America, and, with a force of nearly 2,000 British and provincial troops, reached the Monongahela, a branch of the Ohio, on July 8, 1755. Leaving the baggage behind, on the 9th he pushed forward with a chosen force to invest Fort Duquesne, on the present site of Pittsburgh, Pa. On the right bank of the river his advance guard was attacked by a party of about 900 French and Indians from the fort. After two hours' fighting, in which Braddock, whose bravery was never called in question, had four horses shot under him, and was mortally wounded while vainly trying to rally his men, the survivors made a hasty retreat under Washington, Braddock's aide-de-camp, the only one of his staff who escaped unhurt. No less than 63 out of 86 officers, and 914 out of 1,373 men engaged, were either killed or wounded. The French loss was trifling. Braddock was carried from the field, and died July 13, 1755, at Great Meadows.

BRADDON, MARY ELIZABETH, an English novelist, born in London in 1837. She very early showed a turn for literature, which she indulged by sending verses and other trifles to the magazines and newspapers. In 1860 she essayed a more sustained effort in a comedietta called "The Loves of Arcadia," which was brought out at the Strand Theater. Her first great success came with the publication, in 1862, of "Lady Audley's Secret," which instantly attained a great popularity, which has since been extended by the production of numerous works of the same order, such as "Aurora Floyd," "Eleanor's Victory," "Loves of Arden," "Dead Sea Fruit," "Weavers and Weft," "Cloven Foot," "Mount Royal," "When the World Was Younger" (1897), "The Green Curtain" (1911), "Miranda" (1913). She died in 1915.

BRADFORD, a municipal and parliamentary borough and important manufacturing town in the W. Riding of Yorkshire, England. The more modern portion has well built streets, and since 1861, most extensive street improvements have been carried out at a cost of about \$5,000,000. There is a large number of scientific, educational, and charitable institutions, among which are the new technical college, the free grammar school endowed by Charles II., the fever hospital, built at a great cost, and the almshouses of the Tradesmen's Benevolent Society. There are several public parks, and an extensive system of waterworks which afford a supply of about 10,000,000 gallons a day. Bradford is the chief seat in England of the spinning and weaving of worsted yarn and woolens. Pop. (1917) 206,338.

BRADFORD, a city in McKean co., Pa., on several railroads; 15 miles N. W. of Smethport, the county-seat. It is in an extensive coal, oil, and natural gas region, and is principally engaged in industries connected therewith, besides having machinery, chemical, boiler, and brick and tile works. The city has electric street railroads, daily and weekly newspapers, National banks, large hospital, and several libraries. Pop. (1910) 14,544; (1920) 15,525.

BRADFORD, WILLIAM, an American colonial governor and author, born in Austerfield, Yorkshire, England, in March, 1588. He was one of the signers of the celebrated compact on the Mayflower; and, in 1621, on the death of the first governor, John Carver, was elected to the same office, which he continued to fill (with the exception of a brief period)

until his death. His administration was remarkably efficient and successful, especially in dealing with the Indians. His "Diary of Occurrences," covering the first year of the colony, was published in 1622. He left a number of religious compositions in verse; and historical prose writings of great value, the most important being his "History of the Plymouth Plantation." He died in Plymouth, Mass., May 9, 1657.

BRADFORD CLAY, the middle member of the upper division of the Lower Oolites as developed in the west of England. It nearly corresponds in age with the limestones of the Great Oolite, but is generally a pale, grayish clay with little calcareous matter, though inclosing bands of impure limestone.

BRADFORD-ON-AVON, or GREAT BRADFORD, an ancient town of England, in Wiltshire, beautifully situated 28 miles N. W. of Salisbury, on the banks of the lower Avon, with manufactures of woolen cloth.

BRADLAUGH, CHARLES, an English reformer, born in London, Sept. 26, 1833. He became a street orator when 14 or 15 years old, and his atheistic opinions date from the same period. Expelled from home on this account, he supported himself in various ways. He edited a journal called the "Investigator" in 1858, and a year later became editor of the "National Reformer." In 1873 he visited the United States and delivered lectures in the prominent cities. He was elected to Parliament for Northampton, in 1880, but for refusing to take the oath he was expelled from the House of Commons. He again appealed to his constituents in 1882, and was re-elected by a small majority, but was not allowed to take his seat. In 1885, no opposition being raised to his taking the oath, he took his seat in Parliament. He died Jan. 30, 1891.

BRADLEY, WILLIAM O'CONNELL, thirty-second Governor of Kentucky (1895-1899); born near Lancaster, Ky., March 18, 1847. During the Civil War he twice enlisted in the Federal army, but was twice discharged on account of his youth. Finally settling down to the study of the law, he was admitted to practice at the age of eighteen by a special act of the Legislature. He was elected Prosecuting Attorney for Garrard county in 1870. In the Republican National convention of 1884 he opposed the contemplated curtailment of Southern representation in national conventions. He was elected the first

Republican Governor of his State in 1895, and was elected to the United States Senate in 1909. He died in 1914.

BRADSHAW, JOHN, an English Puritan, who was President of the High Court of Justice which tried and condemned King Charles I., born in Cheshire, in 1586. In 1649, he was Chief Justice of Chester, and when the trial of the King was determined upon, Bradshaw was chosen to preside. His deportment on the trial was lofty and unbending, and everything was done to give weight and dignity to this unexampled tribunal. On Cromwell's accession to the protectorate, he was deprived of his judgeship, but, on the restoration of the Long Parliament, was elected President of the Council of State. Bradshaw died in 1659, and on his death bed asserted that, if the King were to be tried and condemned again, he would be the first to agree to it. Bradshaw was magnificently buried in Westminster Abbey, whence, after the Restoration, his body was ejected as being that of a regicide, and hanged on a gibbet at Tyburn, with those of Cromwell and Ireton.

BRADSTREET, ANNE, the earliest American poet, born in Northampton, England, in 1612. She was a daughter of Gov. Thomas Dudley. In 1630 she emigrated to America with her husband, Simon Bradstreet, Governor of Massachusetts. Her poems were published as "The Tenth Muse, Lately Sprung Up in America." They are quaint and literal in style. She died Sept. 16, 1672.

BRADWARDINE, THOMAS, "DOCTOR PROFUNDUS," Archbishop of Canterbury, born in Chichester, in 1290. He was distinguished for his varied learning, and for his treatise, "De Causa Dei contra Pelagium," an extensive work against the Pelagian heresy, for centuries a standard authority. He was chaplain and confessor to Edward III. Being appointed archbishop he hastened to England, but died of the black death on reaching London, Aug. 26, 1349.

BRADY, JAMES HENRY, a United States Senator from Idaho, born in Indiana co., Pa., in 1862. He received his education at the Leavenworth, Kan., State Normal School. In 1894, he removed to Idaho where he later became President of the Idaho Consolidated Power Company and was associated with other large State enterprises. He became a prominent figure in politics and was made Governor of Idaho for the term 1909-1911. He was chosen

United States Senator in 1913. He died in 1918.

BRADY, NICHOLAS, with NAHUM TATE, versifier of the Psalms, born in Bandon, Ireland, in 1659. He was educated at Westminster, Christ Church (Oxford), and Dublin, and kept a school at Richmond. Tate and Brady's metrical version of the Psalms was authorized in 1696, but with the strong opposition of many among the Tory clergy. His tragedy, "The Rape, or the Innocent Impostors," his blank verse and sermons have sunk into oblivion. He died in Richmond, England, May 20, 1726.

BRADYPUS, a mammalian genus, the typical one of the family *bradypodidae*. It contains the *ai*, or common sloth (*B. tridactylus*), and other species. Various extinct genera and species of the family are found in South America. They are gigantic as compared with the modern sloths. The most notable are *megatherium*, *mylodon*, *scelidotherium*, and in the Post-Pliocene of North America, *megalonyx*.

BRAEMAR, a Highland district in the S. W. corner of Aberdeenshire. It contains part of the Grampian range with the heights of Ben Macdhui, Cairntoul, Lochnagar, etc. The district has some fine scenery, valleys and hillsides covered with birch and fir.

BRAGA, a city of Portugal, capital of the province of Minho, situated on an eminence between the rivers Cavado and D'Este, 34 miles N. E. of Oporto by rail. It is the residence of the Primate of Portugal, who has a palace here. It has also a fine Gothic cathedral (12th century), partly modernized, the Church of Santa Cruz (1642), and manufactures of linen, hats, cutlery, firearms, jewelry, etc. The Bracara Augusta of the Romans, it retains ruins of a temple, an amphitheater, and an aqueduct. Near it is the celebrated *Sanctuario do bom Jesus do Monte*, which is still a place of pilgrimage. In the 6th century, Braga was the chief city of the Suevi, and it fell successively into the hands of the Goths and Moors, from the latter of whom it was taken by Alphonso of Castile. Braga produces hats, arms, textiles, and gold and silver articles. Pop. about 25,000.

BRAGANÇA, the name of two considerable towns in Brazil. (1) Bragança, a seaport, 100 miles N. E. of Para, at the mouth of the Caite, which is here navigable to the town. Pop. of town about 6,000. (2) Bragança, an

inland city of about 10,000 inhabitants, 50 miles to the N. E. of São Paulo.

BRAGANZA, or **BRAGANÇA**, a town of Portugal, capital of the former province of Tras-os-montes, with a castle, the ancient seat of the Dukes of Braganza, from whom the present reigning family of Portugal are descended. Pop. about 3,500.

BRAGANZA, or **BRAGANÇA**, the name of the last reigning dynasty of Portugal. In 1801 Napoleon I. declared that the line of the Braganza sovereigns had ceased. John, Regent of the kingdom, withdrew to Brazil in 1807, but he returned in 1821. At his death, in 1826, his son, Dom Pedro, resigned the throne in favor of his daughter, Maria da Gloria, preferring to remain Emperor of Brazil, which he had been elected by the Brazilians, Nov. 18, 1825.

BRAGG, **BRAXTON**, an American military officer, born in Warren co., N. C., March 22, 1817; graduated at West Point, in 1837; was appointed Second Lieutenant in the 3d Artillery; served with distinction under General Taylor in the Mexican War; and retired to private life in 1856. At the outbreak of the Civil War, he became a Brigadier-General in the Confederate army, and was stationed at Pensacola to act against Fort Pickens. He took an important part in the two days' battle of Shiloh. On the death of Gen. A. S. Johnston he was appointed to his command, with the full rank of General, and succeeded General Beauregard as commander of the Department, in July of the same year. The last command he resigned in December, 1863. His chief success was at Chickamauga, in September, 1863, when he inflicted a defeat on the army of General Rosecrans, but was himself in turn defeated by General Grant, which led to his temporary removal from command in January, 1864, and he was appointed military adviser to Jefferson Davis. In 1864, he assumed command of the department of North Carolina. After the war he was chief engineer of the State of Alabama. He died in Galveston, Tex., Sept. 27, 1876.

BRAGI (brá'jē), the son of Odin and Frigga, and the god of eloquence and poetry. He is represented as an old man with a long flowing beard, like Odin; yet with a serene and unwrinkled brow. His wife was Idunna.

BRAHAM, JOHN (brā'am), an English tenor singer, of Jewish extraction, born in London, in 1774. He appeared

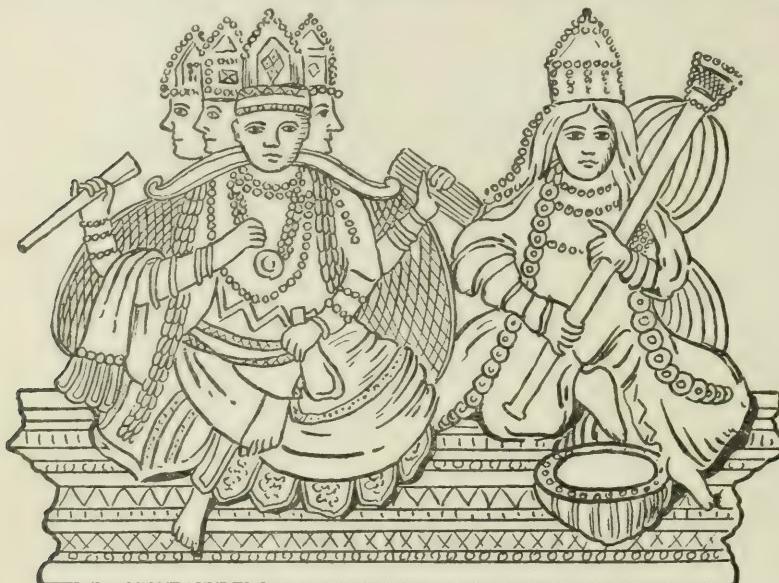
with the greatest success on the leading stages of France, Italy, and the United States, as well as in his own country. He excelled mainly in national songs, such as "The Bay of Biscay, O," and "The Death of Nelson," and continued to attract large audiences even when 80 years old. He died in 1856.

BRAHE, TYCHO (brä'e), a Swedish astronomer, born in Knudstrup, near Lund, Dec. 14, 1546. He was descended from a noble family, and was sent, at the age of 13, to the University of Copenhagen. An eclipse of the sun turned his attention to astronomy. His uncle destined him for the law, but Brahe, while his tutor slept, busied himself nightly with the stars. He succeeded, as early as 1563, in detecting grave errors in the Alphonsine tables and the so-called Prutenic (*i. e.*, Prussian) tables, and set about their correction. At Wittenberg, where he resided for a short time, he lost part of his nose in a duel with a Danish gentleman; but contrived one of gold, silver and wax. After two years spent in Augsburg, he returned home, where, in 1572, he discovered a new and brilliant star in the constellation Cassiopeia. In 1573 he married a peasant girl. After some time spent in travel, Brahe received from his sovereign, Frederic II., the offer of the island of Hven of Hoëne, in the Sound, as the site for an observatory, the King also offering to defray the cost of erection, and of the necessary astronomical instruments, as well as to provide him with a suitable salary. Brahe accepted the generous proposal, and, in 1576, the foundation stone of the castle of Uranienburg ("fortress of the heavens") was laid. Here, for a period of 20 years, Brahe prosecuted his observations. Frederic II. died and under Christian IV. Brahe had his emoluments cut off and left the country. After residing a short time at Rostock and at Wandsbeck, near Hamburg, he accepted an invitation of the Emperor Rudolf II.—who conferred on him a pension—to Benatek, a few miles from Prague, where a new Uranienburg was to have been erected for him; but he died at Prague on Oct. 24, 1601.

BRAHMA, the name of the first of the three gods who constitute the Trimurti, or triad of principal Hindu deities. The epithets applied to this divinity are very numerous, some of the most usual being *Swayambhu*, the self-existing; *Parameshti*, who abides in the most exalted place; *Pitamaha*, the great father; *Prajāpati*, the lord of creatures;

Lokesa, the ruler of the world, etc.; Brahman, the essence of the Supreme Being in the abstract, devoid of personal individuality, to whose name so much reverence is attached that it is considered criminal to pronounce it, is said to have given birth to Brahma, Vishnu and Siva simultaneously; and to have allotted to the first the province of creating, to the second that of preserving, and to the third that of destroying. Accordingly, ever since the creation of the world, Brahma has had little or nothing to do, and it will not be till the 10th

querors of India, who discharged priestly functions, whose ascendancy, however, over his fellows was intellectual and spiritual, but not yet political or supported by the caste system; also one of the four leading castes of India, the others, theoretically at least, being *Kshatryas* (warriors), *Vaisyas* (merchants), and *Sudras* (laborers), not reckoning outcasts beyond the pale. They are the most intellectual of all castes, having great mental subtlety. They are admirably adapted for metaphysical speculation, and for mathema-



BRAHMA, WITH CONSORT SARASVATI

avatar, or incarnation, that his services will be put in requisition, when this world is to undergo total annihilation. Meanwhile, however, the other deities, Vishnu and Siva, are constantly engaged in their respective duties of preservation and destruction; and the Hindus lavish chiefly their adoration upon those divinities from whom they expect to derive immediate advantage. In the mythological poems, and in sculpture, Brahma is represented with four heads, or rather faces, and holding in his four hands a manuscript book containing a portion of the Vedas, a pot for holding water, a rosary, and a sacrificial spoon. In the sculptures of the cave temple of Elephanta, he is represented sitting on a lotus, supported by five swans or geese.

BRAHMAN, BRAHMIN, BRAMIN, or BRACHMAN, one of the Aryan con-

tical reasoning; but throughout their vast literature they have almost uniformly told monstrous myths in lieu of history. Nor do they care much for natural science.

BRAHMANA BEADS, a name given in India to the corrugated seeds of *elaeocarpus*, used by the Brahmins and others as necklaces.

BRAHMAN BULL, the zebu, a variety of the *bos taurus*, or common ox. It is distinguished by having a large, fatty hump on its shoulders. Divine honors are paid to it in India, and it is deemed an act of piety to turn one loose in the streets, without any provision for its maintenance. It, therefore, helps itself from grocers' stalls or from gardens.

BRAHMANI, a female Brahman; the wife of a Brahman. Also written Brahminee.

BRAHMANISM, or **BRAHMINISM**, the system of religious belief and practice, introduced and propagated by the Brahmins. This greatly varied with the lapse of ages, but to every successive form of it the name Brahmanism may be applied. The earliest inhabitants of India seem to have been mainly Turanians. When, at a very remote period of antiquity, these entered the peninsula, an Aryan nation or tribe existed in central Asia, N. W. of India, speaking a language as yet unrecognized, which was the parent of nearly all the present European tongues, our own not excepted. At an unknown date a great part of this Aryan nation migrated to the N. W., and settled in Europe, the remainder taking the contrary direction, and entering India by the way of the Punjab. Their gods, personifications of nature, are invoked in the 1,017 hymns of the "Rig-Veda," the oldest Aryan book in the world. Professor Max Muller dates the hymns between 1500 and 1200 B. C.

While the Aryans were in the Punjab a religious schism took place among them, and a large number of them left India for Persia with feelings so bitter that what their former friends left behind called gods they transformed into demons. The venerable *Deva* = God, was changed into *daéva* = an evil spirit. Iran (Persia) was the place to which the seceders went, and there their faith developed into *Zoroastrianism*.

The "Rig-Veda" was followed by three more, the "Yajur-veda," the "Sáma-veda," and the "Atharva-veda," each with a Sanhit, or collection written in poetry, and Bráhmanas and Sútras, prose compositions; but these are not so valuable as the "Rig-Veda" for tracing the old beliefs. From about 1000 to 800 B. C. collections were being made of the old sacred literature. From about 800 to 600 B. C. the Bráhmanas were composed. Then the Sútras (exegetical compositions), which follow, make Bráhmanas as well as Mantras divine.

The exact date of the two great epic poems—the "Ramayana," and the "Mahabharat"—is unknown; but the former is believed to be the older. By the time that it appeared, the constellation of Vedic gods had set, and one of deified heroes was arising or had arisen. Rama, the deified King of Ayodhya (Oude), the hero of the former poem, is still extensively worshipped, along with Hunooman, the monkey god and Krishna, the hero of the Mahabharat.

During the period of the Bráhmanas, the Brahmanic priesthood had arisen to great power; during that of the Sútras

they were in quiet enjoyment of their caste dignity. By the 6th century Buddha had arisen to preach the equality of all castes, and his system was dominant in India from about 250 B. C. till 750 A. D., that is, for 1,000 years.

When Brahmanism reasserted its sway the Hindu triad of gods—Brahma, Vishnu and Siva—had arisen (see these words). Nay, Brahma had become almost obsolete, and the respective advocates of Vishnu and Siva were at variance. Between the 12th and the 16th centuries monastic reformers formed sects, some Vishnuvite, others Sivaite. New sacred books, called, however, Puranas (meaning old), are penned to advocate the tenets of conflicting sects, and, though contradicting each other, were accepted as divine. The Mohammedan invasion somewhat repressed their quarrels. At present, the worship of Vishnu under the forms of Krishna and of Rama, and of Siva under that of the Lingam with the veneration of Suktí, the power and energy of the divine nature in action; to which must be added the adoration of Hunooman, Rama's friend; and, in many places of aboriginal Turanian gods, are the most prevalent forms of popular Hinduism. Reformers are falling back on the Vedas, and Christianity obtains converts from it in every part of the land.

BRAHMAPUTRA (brä'ma-pö'tra), a large river of Asia, whose sources, not yet explored, are situated near Lake Manasarovara, in Tibet, near those of the Indus. In Tibet, where it is called the Sanpo, it flows eastward N. of the Himalayas, and, after taking a sharp bend and passing through these mountains, it emerges in the N. E. of Assam as the Dihong; is joined by the Dibong and the Lohit, when the united stream takes the name of Brahmaputra. After entering Bengal it joins the Ganges at Goalanda, and farther on the Meghna, and their united waters flow into the Bay of Bengal. Its total length is, perhaps, 1,800 miles.

BRAHMS, JOHANNES (brämz), a German composer, born in Hamburg, May 7, 1833. In 1861 he went to Vienna, where he devoted himself to composition. His great "German Requiem" (1868) established his reputation. He was the composer of many symphonies, "Rinaldo," "The Song of Destiny," songs, cantatas, etc. His unrivaled settings of "Hungarian Dances" and his own "Liebeslieder" dances with choral accompaniment, rank with the finest compositions. He died in Vienna, April 3, 1897.

BRAID, JAMES, a Scotch physician, born in Fife, in 1795, studied medicine at Edinburgh, and settled as a surgeon in Manchester. He is noted for his researches on animal magnetism, which he called hypnotism. He died March 25, 1860.

BRAILA, a town in Rumania, formerly a fortress, on the left bank of the Danube, which divides itself here into a number of arms, one of them forming the harbor of the town. The export of grain and the sturgeon fisheries are among the principal industries. Pop. about 61,000.

BRAILLE, LOUIS (bri'ē), a French teacher of the blind, born in 1809. He invented the Braille alphabet. It consists of a system of points printed on cardboard by indenting the reverse side. The writing is traced with the finger. He died in 1852. See BLIND.

BRAIN, the encephalon, or center of the nervous system and the seat of consciousness and volition in man and the higher animals. It is a soft white and gray matter contained in the skull of vertebrate animals. The invertebrates have, instead of a true brain, nervous ganglia, situated near the end of the body. The external gray matter is softer than the white matter and consists of variously shaped nerve cells communicating with nerve fibers, and thereby receiving and discharging impressions. The internal white matter is composed almost entirely of medullated nerve fibers which transmit nerve impulses from one point to another. The brain is enveloped by three membranes called the *Dura mater*, which is dense and elastic; the *Arachnoid*, thin and double; and the *Pia mater*, which covers the whole surface of the brain and supplies the nervous tissues. These support the blood vessels which nourish the cranium and the brain, and also contain a clear fluid, the cerebro-spinal fluid, which removes the product of the brain waste and serves like a water cushion to diminish the effect of external shocks. The brain consists of two principal parts, the *cerebrum* and *cerebellum*, connected by bands of fibers. The cerebrum—great brain or cerebral hemisphere—occupies in man the upper part of the head and is seven or eight times larger than the cerebellum, which lies behind it and below it in a peculiar cavity of the skull. The cerebrum is divided into two portions, the right and left hemispheres, by the longitudinal fissure, the hemispheres being at the same time transversely connected by a band or bridge of nervous matter called the *corpus callosum*. The

cerebellum, like the cerebrum, is also divided into right and left hemispheres, connected by a bridge of nervous matter called the *pons Varolii*, under which is the *medulla oblongata*, or continuation of the spinal marrow. At the base of the brain are several masses of nervous matter or ganglia known as the *corpora striata* (two), and *optic thalami* (two), and *corpora quadrigemina* (four); and there are in it certain cavities or *ventricles*.

Cerebrum.—The cerebrum underlies the whole vault of the cranium and covers all the rest of the brain. The hemispheres, which are divided by a deep median fissure, are covered by a thin layer of matter, or nerve cells, and thrown into ridges or furrows called convolutions or *gyri* and fissures. These ridges are the result of the folding of the cerebral surface during the growth of the brain. On the outer surface of these hemispheres is the *fissure of Sylvius*, which is a deep incision at the base of the brain and runs in several directions. The *fissure of Rolando* runs almost vertically from the fissure of Sylvius nearly to the border of the hemispheres. On the inner surface, half way between the central fissure and the rear end of the brain, is the *parieto-occipital incision*. These fissures form the boundaries of the various lobes of the cerebrum. (1) The *frontal lobe* is that part of the outer and corresponding median surfaces which lies anterior to the fissure of Rolando, and is probably associated with the exercise of the higher mental faculties. (2) The *temporo-sphenoidal lobe* lies below the fissure of Sylvius. (3) The *occipital lobe* lies behind the parieto-occipital fissure and includes the corresponding parts on the outer surface. (4) The *parietal lobe* is bounded by the fissures of Rolando and Sylvius, and by the occipital lobe. (5) The *central lobe* or *island of Reil* lies at the bottom of the fissure of Sylvius and is hidden in the adult by overreaching adjacent lobes. Secondary fissures on these lobes divide them into *convolutions*. On the under surface of the cerebrum are two olfactory nerves and two optic nerves. The olfactory nerves cross like the letter X, wind around the two cerebral peduncles and terminate in the olfactory thalami and the olfactory lobe. These peduncles pass from under the surface of the hemispheres and approach each other as they enter the Varolii. If we press apart the two cerebral hemispheres, we come upon the *corpus callosum*, which is a band of white fibers connecting the convolutions of both hemispheres. On dividing these and removing some white fibers and a layer of

connected tissue called *velum interpositum*, with its vascular margin, we expose the two lateral and the third ventricles of the cerebrum, the former occupying the hemispheres, the latter lying between them and continued backward through a narrow channel (the aqueduct of Sylvius) into the fourth ventricle, which lies behind the pons Varolii and the medulla. Projecting into the third and lateral ventricles are rounded masses of gray matter, the *corpus striatum* and *optic thalamus*, called the basal ganglia. The whole cerebrum is surrounded by a thin, convoluted envelope of gray matter about a quarter of an inch thick. Within this lies the *centrum ovale*, composed of white nerve fibers passing in all directions and difficult to unravel. Connecting the two hemispheres is the *corpus callosum*. Underneath are the *septa lucida* and the *fornix*. Into the ventricles project the ovoid optic thalamus and the caudate nucleus of the corpus striatum. A wedge-shaped mass of gray matter, the *lenticular nucleus* of the *corpus striatum*, is separated from the first two nuclei by a band of white fibers. The *internal capsule* is composed of two parts, an anterior and posterior limb, which meet each other at an obtuse angle (the knee). Directly outside the lenticular nucleus is the white *external capsule*, separated by the claustrum, a thin band of gray matter, from the island of Reil. Some of the fibers of the claustrum ovale connect the frontal and occipital lobes, others connect the basal ganglia with the cortical gray matter. An important group, the *corona cortex*, passes from the internal capsule to the whole of the cortex. That part of the *corona radiata* entering the occipital lobes is called the *optic radiation* of Gratiolet, who considered it to be the central expansion of the optic nerve.

The *optic lobes* consist of anterior and posterior pairs of rounded eminences of gray matter situated close to the optic thalami and underlying the pineal gland, a cone-shaped organ thought by Descartes to be the seat of the soul. Research justifies the belief that this is the remains of the pineal eye; the third organ of sight, formerly found in the lower animals. The optic lobes are closely connected with the optic nerves, part of these ending in the anterior pair, and to the third and fourth nerves, whose nuclei of origin lie just underneath them in front of the aqueduct of Sylvius. The *crura cerebri* are formed of fibers passing up from the medulla cord and from the cerebellum to the cerebrum. Removing the cerebral lobe

from an animal deprives it of volition and intelligence and a similar experiment on man, or an imperfect development of the cerebrum, results in imbecility and idiocy, and the races that have the heaviest cerebra and the most fully developed convolutions have the most intelligence. Among animals the degree of intelligence increases with the increase in size of the cerebrum relatively to the other parts of the brain.

The *cerebellum* possesses a median and two lateral hemispheres which have been subdivided into lobes. Its parts are arranged in thin laminae or folia with deep intervening fissures. These laminae have a central core of white matter with a thin covering of gray matter. The cerebellum has three pairs of peduncles: (a) Superior, which pass upward and across the middle line toward the opposite cerebral hemisphere but ending under the optic lobe; (b) middle, which is that part of the pons Varolii which enters indirectly into connection with fibers from the opposite cerebral hemisphere; (c) inferior (the restiform body), which are connected with the medulla and spinal cord. There is also a close connection with the auditory nerve and semicircular canals of the ear.

Medulla Oblongata.—This is the lowest and most dependent division of the brain. It is conical in form, with the base toward the pons Varolii, the narrow end toward the spinal cord, with each side of the middle line of the *anterior pyramids* crossing the other where the medulla passes into the spinal cord. External to them is the ovoid projection. The olfactory body of the dorsal surface is the lozenge-shaped fourth ventricle, which is bounded below with the two inferior and above by the two superior peduncles of the cerebellum. Destruction of the anterior part of the medulla causes a tendency to fall forward. Loss of its posterior part causes a tendency to fall backward; and of one lateral lobe to rotate toward the side injured. Stimulation of any of the parts causes movements of the head, eyes, and limbs such as would counteract the disturbance of the equilibrium by the destruction of the parts. The medulla is the great seat or center for the functions of organic life, as it gives origin to all the cranial nerves except the first four numbers. These centers are the center for respiratory movements, under the extremity of the fourth ventricle; (2) for the restraint and acceleration of the heart; (3) for the control of the blood pressure including the diabetic center, which is simply a vaso-motor center for the liver; (4) the center for swallowing; (5) center for the move-

ments of the gullet and stomach; (6) movements of articulate speech; (7) for the suppression of the saliva.

Every part of the brain is exactly symmetrical with the part opposite. Twelve pairs of nerves proceed from the base of the brain, including the nerves for the organs of sight, hearing, taste, and of smell and of touch, also those for the muscles of the face, those for the cavity of the mouth and for the larynx.

Sight.—Destruction of one lobe causes permanent blindness in one side of both eyes. In man, disease of the left angular gyrus produces what is called "word-blindness." In this condition, one loses the power of reading words, although one sees the characters distinctly and may be even able to spell the word, and write it, and yet be unable to read what has been written.

Hearing.—The center of hearing seems to lie in the first temporal sphenoidal convolution in both sides. Partial destruction of this convolution on the left side causes the condition of "word deafness," that is, to hear sounds but have no sense of their meaning.

Taste and Smell.—Ferrier locates the sense of taste and of smell in the uncinate gyrus on the inner surface of the temporo-sphenoidal lobe.

Touch.—Some physiologists place these in the motor area. Fibers from the various sense organs lead to the cortical areas through the posterior third of the internal capsule. If this is injured, loss of all forms of sensibility, hearing, sight, taste, etc. of the opposite side follows.

In man the brain weighs from two to four pounds; the average weight in male European adults being 49 to 50 ounces or about 1-35th of the weight of the body; in the dog the average weight is about 1-120th of the animal; in the horse 1-450th. The brain of females weigh five ounces less on the average than that of males. The ratio of the brain—weight to that of the body—is the same in both sexes; consequently the difference of weight in the brain of males and females is due to the lesser body weight in the woman and not to inferior cerebral development. At birth, the proportionate weight of the brain to the body is greatest. It diminishes slowly to the 10th year, when 1:14 is the ratio. About the 40th year the brain is heaviest. After that it diminishes at the rate of an ounce every 10 years. The theory that the size and weight of a man's brain is in direct proportion to his intellect is discredited.

The brain attains its highest degree of development earlier than any other part of the body. The parts lying in front

have functions connected with the intellectual part of man's nature; while the parts lying nearer the back belong to the merely animal or organic nature. As the central organ of the nervous system the brain is sympathetically affected in nearly all cases of acute diseases.

Diseases of the Brain.—Diseases of the brain fall into two classes, according as they exhibit mental characteristics alone, or also anatomical disturbances. To the former class belong hypochondria, mania, etc. Among the latter may be mentioned meningitis, or inflammation of the membranes of the brain, which seldom occurs without affecting the substance of the brain also, and thus giving rise to phrenitis, hydrocephalus, or water in the head, caused by pressure of water in the cavities of the brain. Consult "Diseases of the Nervous System," Jeliffe and White (1917).

BRAINERD, a city of Minnesota, the county-seat of Crow Wing co. It is on the Northern Pacific and the Minnesota and International railroads, and on the Mississippi river. It is an important industrial community and has machine shops of the Northern Pacific railroad, lumber yards, cigar factories, flour mills, paper mills, etc. There is a court house, Y. M. C. A. building, a library, public park, and St. Joseph's Hospital. The city has a large export trade in lumber, grain, hay, furs, and iron. Pop. (1910) 8,526; (1920) 9,591.

BRAIN FEVER, a term in common use for inflammation of the lining membranes of the brain, meningitis; or of the brain itself, cerebritis. These are generally found in conjunction, seldom separate, and are termed phrenitis or encephalitis. Often associated (a) with tuberculosis, or scrofula; sometimes (b) with gout, rheumatism, or syphilis; in the first instance generally in the case of children and delicate young females, in the others chiefly in adult males; very frequently, also, from injury, or as a consequence of previous diseases. Brain fever is characterized by violent headache, intolerance of light, excitement, extreme sensitiveness, hyperæmia, delirium, convulsions, and coma.

BRAINTREE, a town in Norfolk co., Mass.; on the New York, New Haven and Hartford railroad; 10 miles S. of Boston. It contains the villages of South and East Braintree; has electric street railroads to the principal near-by towns and villages, and is principally engaged in granite quarrying, and the manufacture of tacks, shoes, wool, rubber goods, and fans. John Adams, John Quincy Adams, and other members of

that family were born here. Pop. (1910) 8,066; (1910) 10,580.

BRAKE, a contrivance for retarding or arresting motion by means of friction. In machinery it generally consists of a simple or compound lever, that may be pressed forcibly upon the periphery of a wheel, fixed upon a shaft or axis. See AIR BRAKE.

BRAMA, a genus of spiny finned fishes belonging to Cuvier's family *squamipennes*, meaning scaly-finned fishes, now called *chætodontidæ*. It contains but one species, the *brama raii*, which is common in the Mediterranean.

BRAMANTE D'URBINO (brä-man'-té), (real name DONATO D'ANGELO), an Italian architect, born in 1444. Showing an early taste for drawing, he was brought up to the profession of a painter, but he quitted it to dedicate his talents to architecture, which he cultivated with uncommon success. He first designed and commenced in 1513, the erection of St. Peter's at Rome, carried on and finished by other architects after his death. Pope Julius II. made him superintendent of his buildings, and, under that pontiff, he formed the magnificent project of connecting the Belvidere Palace with the Vatican by means of two grand galleries carried across a valley. He built many churches, monasteries, and palaces at Rome, and in other Italian cities. He preferred the classic architecture of the Greeks, and was the instructor of Raphael in that art. Bramante painted portraits with ability, and he was skilled in music and poetry. He died in 1514.

BRAMATHERIUM, a genus of *antilopidæ*, consisting of a gigantic species with four horns. It is allied to *sivatherium*, which also is four-horned. Both occur in the Upper Miocene, or Lower Pliocene beds of the Sewâlik Hills in India.

BRAMBANAN, a district of the province of Surakarta, Java, rich in remains of Hindu temples, of which there are six groups, with two apparently monastic buildings. The edifices are composed entirely of hewn stone. The largest is a cruciform temple, surrounded by five concentric squares, formed by rows of detached cells or shrines, embracing an area of 500 feet square. Several of these *dagobas* contain cross-legged figures of Buddha.

BRAMBLE, or **BLACKBERRY** (*rubus fruticosus*), a plant common in Great Britain and most parts of Europe, having prickly stems, which somewhat resemble those of the raspberry. The

flowers do not appear till the summer is considerably advanced, continuing to be produced till the frosts of winter set in. The bramble is little cultivated in Great Britain. This being one of the most variable of British plants, its systematic arrangement has been a matter of great controversy. Baker enumerates 21 sub-species, of which most again pass into varieties. In the United States, where they are called blackberries, they are extensively cultivated for their fruit; and, of late, American kinds have been with advantage introduced into Great Britain. Species of *rubus* very similar to the common bramble, or varieties of it, abound in the northern parts of Asia, the Himalaya Mountains, and North America.

BRAMBLING, **BRAMBLE FINCH**, or **MOUNTAIN FINCH**, a bird of the family *fringillidæ*. It breeds in the more northern parts of Scandinavia; visiting Italy, Malta, Smyrna, etc., in its winter migrations. It has no song, its call note being a single monotonous chirp. It is rather larger than the chaffinch. The tail is forked, and its prevailing colors are black, white, and yellow.

BRAN, the skins or husks of ground maize, wheat, rye, or other grain, separated from the flour. The outer skin, or coarse bran, is very indigestible, owing to the presence of a layer of silica. The inner skins, called pollards, are more nutritious, containing from 12 to 15 per cent. of nitrogenous matter, and from 20 to 30 per cent. of starch. Unless, however, they are ground very finely, they are apt to set up irritation of the bowels and diarrhoea. Though rich in nitrogen, bran appears to possess but little nutritive power. It may be of use to those who are well fed, and need a laxative. It is largely employed in the feeding of horses and cattle, and in brightening goods during the processes of dyeing and calico printing.

BRANCH, that part of a plant which is produced from a lateral leaf bud on the primary axis or stem. It is looked upon as part of the stem, and not as a distinct organ. A branch generally produces secondary branches, and these give rise to minor ramifications, called branchlets or twigs. The different modes in which branches spring from the stem give rise to the various forms of trees; such as pyramidal, spreading, and weeping.

BRANCHIA, the gills of fishes and various other inhabitants of water. They are the apparatus for enabling the animal to extract oxygen from the water,

instead of being dependent on the atmosphere.

BRANCHIOPODA, Cuvier's first order of the sub-class entomostraca. The genera included under it, such as cyclops, cypris, apus, limnadia, branchipus, etc., are now generally ranked under several orders, viz., *copepoda*, *ostracoda*, and *phyllopoda*. It is also a division or "legion" of the sub-class entomostraca. It includes the orders *cladocera*, *phyllopoda* and *trilobita*, perhaps with *mesostoma*.

BRANCHIOSTOMA, Costa's name for the very anomalous genus of fishes now called amphioxus.

BRANCO, RIO, a river of northern Brazil, which rises in the Parima Mountains, on the very borders of Venezuela; and, after a S. course of about 400 miles, joins the Rio Negro, of which it is the principal tributary, on its way to the Amazon.

BRANDEGEE, FRANK BOSWORTH, United States Senator from Connecticut; born in New London, in 1864. He studied at Yale, from which he graduated in 1885. He chose the profession of law and was admitted to the bar in 1888. In that year he was elected to the Connecticut General Assembly, and was made Speaker of that body in 1899. In 1902 he was elected a Representative to the Fifty-seventh Congress and re-elected for the two following terms. He was elected as United States Senator, May 9, 1905; re-elected Jan. 20, 1909, and again on Nov. 3, 1914. He was active in affairs relating to Mexico and took an active stand in opposing ratification of the Versailles Peace Treaty.

BRANDEIS, LOUIS DEMBITZ, an American jurist; born in Louisville, Ky., in 1856. He studied in German schools abroad and also at Harvard University. He was admitted to the bar in 1878. From 1879 to 1916, he practiced law in Boston, where he built up a large clientele and achieved a reputation as a lawyer of remarkable learning and acumen. He was counsel in many cases of national interest, being usually on the side of the public where large corporate interests were concerned. In freight rate cases, eight-hour law controversies, and matters of wage dispute, he has been prominent and he has often been called on to act as arbitrator. He was nominated as a justice of the Supreme Court by President Wilson in 1916, and was confirmed in the face of considerable opposition. He was the first Hebrew to sit on the Supreme Court bench. He was active in the Zionist movement,

and in 1920 went to Europe to attend a conference on that question.

BRANDENBURG, a province of Prussia, surrounded mainly by Mecklenburg and the provinces of Pomerania, Posen, Silesia, and Prussian Saxony. The soil consists in many parts of barren sands, heaths, and moors; yet the province produces much grain, as well as fruits, hemp, flax, tobacco, etc., and supports many sheep. The forests are very extensive. The principal streams are the Elbe, the Oder, the Havel, and the Spree. Berlin is located in Brandenburg. Area 15,400 square miles, population about 4,000,000, including the city of Berlin. The Old Mark of Brandenburg was bestowed by the Emperor Charles IV. on Frederick of Hohenzollern, and is the center round which the Kingdom of Prussia grew. The town of Brandenburg is on the Havel, 35 miles W. S. W. of Berlin. It is divided into three parts—an old town, a new town, and a cathedral town—by the river, and has considerable manufactures, including silk, woolens, leather, etc. Pop. about 55,000.

BRANDES, GEORG (bran'des), a Danish literary critic of Jewish family, born in Copenhagen, Feb. 4, 1842, where he graduated at the university in 1864. Several books on athletic and philosophic subjects brought on him a charge of scepticism, which was not removed by an epoch-making series of lectures, published under the title, "The Great Tendencies of Nineteenth-Century Literature" (1872-1875). His "Danske Digttere," a masterpiece of psychological analysis, appeared in 1877; but the hostility of his enemies induced him in the same year to leave Denmark, and settle in Berlin, where he published biographies of Lasalle (1877), and Lord Beaconsfield (1879). In 1882 he returned to Copenhagen, his countrymen having guaranteed him an income of 4,000 crowns, with the one stipulation that he should deliver public lectures on literature. His later works include "Den Romantiske Skole i Frankrig" (1882); a biography of Ludvig Holberg (1885), and a valuable study of Shakespeare, published in an English translation in 1899; "Main Currents of 19th Century Literature" (1906).

BRANDING, an ancient mode of punishment by inflicting a mark on an offender with a hot iron. It is generally disused under the English civil law, but has been employed to punish deserters. It is not, however, now done by a hot iron, but with ink, gunpowder, or some other preparation, so as to be visible and permanent. The mark is the letter

"D," affixed on the left side two inches below the armpit.

BRANDLING, a species of fish, the parr or young of the salmon, so named from its markings being, as it were, branded. The name is also given to a small, red worm used for bait in freshwater fishing.

BRANDT, SEBASTIAN, a German author, born in Strassburg, in 1458; studied law and the classics at Basel, where he received permission to teach; and soon became one of the most influential lecturers. The Emperor Maximilian appointed him an imperial councilor. His fame rests wholly upon "The Ship of Fools," a satire on the follies and vices of the time (1494). Its distinguishing note is its abounding humor; but it owed its great popular success very largely to the clever woodcuts with which it was illustrated. It was translated into several European languages. The English translation by Henry Watson appeared in 1517. Brandt died in Strassburg in 1521.

BRANDY, a spirit produced by the distillation of both white and red wines, prepared chiefly in the south of France. A brandy highly esteemed is that of Cognac, which is obtained by distilling white wines of the finest quality. An inferior kind of spirit is frequently prepared from the "marc" of grapes and the refuse of wine vats. When first distilled it is as colorless as alcohol, and continues so if kept in bottles or jars. When stored in casks, however, it acquires from the wood a pale amber tint, and in this state is sold as pale brandy. The dark color of brown brandy is produced artificially, to please the public taste, by means of a solution of caramel. The development of viticulture in the Western States, particularly in California, enabled American enterprise to produce a brandy that was a formidable rival to the French article. Genuine brandy consists of alcohol and water, with small quantities of cinnamthie ether, acetic ether, and other volatile bodies produced in the process of fermentation. The value of brandy as a medicine depends on the presence of these ethers and other volatile products; when, therefore, it is adulterated with raw grain spirit and water, the amount of these ethers is so reduced that the brandy becomes almost valueless for medical purposes.

BRANDYWINE CREEK, in Pennsylvania and Delaware, is formed of two forks, the E. and W., which effect a junction in Chester co. of the first named

State, and, taking a S. E. course, empties into Christiana creek at Wilmington. Here, Sept. 11, 1777, was fought a severe battle between the British and German troops, 18,000 strong, under Howe, and the Americans numbering 13,000 men, under Washington, in which the latter were defeated. The consequence of this battle was the occupation of Philadelphia by the British troops.

BRANT, JOSEPH, a Mohawk chief, born in Ohio in 1742. He participated in the campaign of 1755, and held the post of secretary to Col. Johnson, superintendent-general of Indian affairs. On the outbreak of the American Revolution, Brant raised an Indian force to oppose the colonists, and was present at the action of Cherry Valley. He tried to prevent the confederation of the Indian tribes, previous to Gen. Wayne's expedition, and opposed peace between them and the United States. Brant was, however, a brave and intelligent chief. In 1786 he visited England, there published the "Book of Common Prayer," and the "Gospel of St. Mark," in Mohawk and English, and collected funds for an Anglican Church, the first erected in Canada West. He passed his last years at Burlington Bay, on an estate granted him by the British Government. One of Brant's sons commanded a mixed Canadian and Indian force during the War of 1812. He died in Canada, Nov. 29, 1807.

BRANTFORD, a town and port of entry of Brant co., Ontario, Canada; on the Grand river, and the Grand Trunk and the Toronto, Hamilton and Buffalo railways; 70 miles E. of London. The town is connected with Lake Erie by a canal. There are manufactures of metal and stone ware, machinery, agricultural implements, and other articles, and the town is the trade center of a large agricultural region. Brantford is the seat of the Ontario Institution for the Education of the Blind, and has several branch banks, and extensive railroad shops. Pop. (1918) 28,725.

BRASENOSE, one of the colleges of Oxford University, founded by William Smith, Bishop of Lincoln, and Sir Richard Sutton, in 1509. The origin of the name is doubtful, but there is a large nose of brass over the entrance. The college is very rich in endowments.

BRASIDAS, a Spartan general, who distinguished himself in the Peloponnesian War, and, in 426 B. C., made himself master of Amphipolis. He was wounded in a combat with Cleon, the Athenian general, who was endeavoring to retake this place. He died 422 B. C.

BRASS, an alloy of copper and zinc, of a bright yellow color, hard, ductile, and malleable. The best brass consists of two parts by weight of copper to one of zinc. The proportions of copper and zinc vary. Ordinary brass is a yellow alloy of copper and 28 to 34 per cent. of zinc. The density of cast brass is 7.8 to 8.4; that of brass wire 8.54. It is harder and yet more fusible than copper, more sonorous and not so good a conductor of heat.

It is said that when the Roman Consul, Mummius, after capturing the celebrated Grecian city of Corinth, barbarously burnt the place to the ground, in B. C. 146, various metals, fused in the conflagration, became united into a compound or alloy, called from the circumstances now stated, Corinthian brass.

BRASSES, MONUMENTAL, large plates of brass, or of the mixed metal called latten or laton, inlaid on slabs of stone, and usually forming part of the pavement of a church. The figure of the person intended to be commemorated was generally represented either by the form of the brass itself, or by lines engraved on it. Such, however, was not always the case, an ornamented or foliated cross, with other sacred emblems, being frequently substituted for the figure. Nor was the practice of imbedding them in the pavement uniform, as they were sometimes found elevated on what were called altar tombs.

BRASSEY, THOMAS, an English engineer and railroad contractor, born in Baerton, Cheshire, Nov. 7, 1805. At the age of 16 he was apprenticed to a surveyor, whom he succeeded in business. After building parts of the Grand Junction and the London and Southampton railways, he contracted, in 1840, in partnership with another, to build the railway from Paris to Rouen. In a few years he held under contract, in England and France, some 10 railways, involving a capital of \$180,000,000, and employing 75,000 men. In partnership with Betts and Peto he undertook the Grand Trunk of Canada, 1,100 miles in length, including the great bridge at Montreal. His army of men were employed in nearly every part of Europe, South America, Australia, India, etc. He amassed great wealth, but continued to be generous to the needy, and modest and simple in his tastes and manners. Sir Arthur Helps wrote his "Life" (1872). He died in Hastings, Dec. 8, 1870.

BRASSICA, a genus of cruciferous plants containing several well known culinary herbs. Among the most famil-

iar may be mentioned *brassica oleracea* (sea cabbage), the original of the cabbage of our gardens, *B. monensis*, the wall flower cabbage; and the *B. campestris*, or common wild navew. The *B. napus*, the rape or cole seed, and the *B. rapa*, or common turnip, have here and there rooted themselves spontaneously, producing a belief that they are indigenous in localities in which they did not originally exist. The colza of the Dutch is *B. campestris*; *B. præcox*, is the summer rape of the Germans; and *B. elongata* is cultivated in Hungary for its oil.

BRASSICACEÆ, an order of plants more generally called *cruciferæ* (crucifers). It is placed by Lindley under his cistal alliance. He divides the order into the following sections—*pleurorrhizæ*, *notorrhizæ*, *orthoploceæ*, and *diplecolobæ*. The *brassicaceæ* or crucifers are one of the most important orders in the whole vegetable kingdom. About 1,730 species are known. Their chief seat is in the temperate zones. Among the well known plants ranked under the order may be mentioned the wall flower, the stock, the watercress and other cresses, the cabbage, the turnip, etc.

BRATIANO, JEAN J. C., a Rumanian statesman. His father had been a prominent factor in forming the modern Rumanian state and in the offer of the throne to Prince Charles of Hohenzollern-Sigmaringen in 1866. The son became leader of the Liberal party, and at the outbreak of the World War favored the cause of the Allies. The King, however, was related to the Hohenzollerns and held Rumania out of the war until his death in October, 1914. After that time, Rumania, under the influence of Bratiano, steadily tended toward participation in the war on the Allied side. The step was finally taken in the summer of 1916 and Bratiano was active in organizing military operations. During the period of disaster that culminated in the signing of the treaty of Bucharest, Bratiano's conduct was dignified and courageous. He was a delegate to the Peace Congress in 1919.

BRATTLEBORO, a town in Windham co., Vt.; on the Connecticut river, and the Boston and Maine and the Central Vermont railroads; 11 miles S. E. of Newfane, the county-seat. It is in a picturesque farming region; is the trade center of southeast Vermont; and contains the State Asylum for the Insane, Brooks Public Library, and manufactures of organs, carriages, furniture, and machinery. Brattleboro is the center of the maple sugar industry of Vermont, and has National banks and several

weekly and monthly periodicals. Pop. (1910) 6,517; (1920) 7,324.

BRAVI (brä've), the name formerly given in Italy, and particularly in Venice, to those who were ready to hire themselves out to perform any desperate undertaking. The word had the same signification in Spain, and both the word and the persons designated by it were found in France in the reign of Louis XIII. and during the minority of Louis XIV.

BRAVURA, an air requiring great skill and spirit in its execution, each syllable being divided into several notes. It is distinguished from a simple melody by the introduction of florid passages, a style of both music and execution designed to task the abilities of the artist.

BRAXY, a disease in sheep. This term is frequently applied to totally different disorders, but the true braxy is undoubtedly an intestinal affection, attended with diarrhoea and retention of the urine. Young sheep are apt to gorge themselves with grass, turnips, etc.; this produces a kind of colic, which usually ends in death. Again, when a lean flock of sheep is placed suddenly on rich food, or on coarse pasture of an indigestible nature, the results may prove fatal. In both cases the sheep are said to die of braxy.

BRAY, a small English parish, near Maidenhead, Berkshire, of which Simon Aleyn was vicar from 1540 to 1588, during the reigns of Henry VIII., Edward VI., Mary, and Elizabeth. He kept his vicarage by changing his faith according to that of the State for the time being, becoming a Protestant with Henry, Catholic again in the reign of Mary, and Protestant again on the accession of Elizabeth. His principle was to live and die Vicar of Bray, and to it he adhered.

BRAY, an Irish seaside town, partly in Dublin county, but chiefly in Wicklow, 13 miles S. E. of Dublin by rail. The beauty of its situation has raised it from a small fishing village to a watering-place, popularly known as the Irish Brighton.

BRAZIL, UNITED STATES OF, a former empire, but, since 1889, a Republic of South America; bounded on the E. by the Atlantic Ocean, and on the N., W., and S. by all the other South American Republics except Chile and Ecuador; length, from N. to S., over 2,600 miles; extreme breadth, about 2,700 miles; capital, Rio de Janeiro.

Area and Population.—The total area of Brazil is 3,280,900 square miles, exceeding by 250,000 square miles the area of the United States, excluding Alaska. There are 20 states, one territory and one federal district. In 1900 the census gave Brazil a population of 17,371,069. The estimated population in 1917 was 27,473,579. This includes about 600,000 Indians in the Amazon region. The largest cities are: Rio de Janeiro, 975,818; São Paulo, 450,000; Bahia, 348,130; Belem, 275,167, and Pernambuco, 216,484. The number of immigrants in 1918 was 20,501. Exceptional advantages are offered by the government to immigrants in order to develop the potential wealth of the country.

Topography.—Its seaboard, about 4,500 miles long, beginning about 200 miles to the N. of the mouth of the Amazon, reaches to within the same distance of the mouth of the Plata and projects into the Atlantic fully 1,000 miles to the E. of the direct line between its two extremes. Among the chief physical features are the enormous valleys of the Amazon, the São Francisco, and the Plata. Brazil has practically no mountain ranges. The so-called ranges of Serra do Mar and Serra da Mantiqueira are merely parallel steps leading from the seaboard to the interior plateau, which occupies nearly one-half of the area of the country S. of the Amazon and E. of the Plata. The highest point in the country is the Itatiaia peak, in the Mantiqueira system, 8,900 feet. There are no large interior lakes. The Lagoa dos Patos and Lagoa Mirim, in the state of Rio Grande do Sul, lie along the coast and measure respectively over 200 and 150 miles in length and 80 and 40 miles in breadth. They are navigable by small seagoing steamers. The chief waterways are the mighty AMAZON (q. v.) with its numerous tributaries, the São Francisco, the Uruguay, the Paraná, and the Paraguay, the union of these three constituting the Plata proper, which runs through Argentine and Uruguayan territory to the Atlantic. On the S. E. coast there are many excellent landlocked harbors, but the entire N. E. coast has very few, most of the ports being at the mouths of the rivers. Besides numerous islands close to the land, among which are conspicuous Marajo in the mouth of the Amazon, an island nearly as large as Great Britain, Itamaraca in the state of Bahia, Ilha Grande in that of Rio de Janeiro, and Santa Catharina in the state of the same name, Brazil has only

two outlying islands: Trinidad and Fernando de Noronha, both of volcanic formation and practically not yet settled.

Production and Commerce.—Among the mineral treasures, besides gold and diamonds, iron of superior quality is abundant; salt, also, is extensively produced in saline marshes by the alternate processes, according to the season, of inundation and evaporation. The exports are coffee, cotton, cocoa, sugar, tobacco, hides, tallow, horns, drugs, precious stones, chiefly diamonds, gold, dyes, rice, manioc, tapioca, spirits, rosewood, etc. The value of exports varies considerably according to the price of coffee, which represents more than three-fourths of the total. The chief articles of commerce are coffee, rubber, cacao, tobacco, and cotton. In the two former, Brazil leads the world. The yield of coffee was 846,480 tons in 1917 and the rubber crop was 41,500 tons. The average annual production of tobacco is 50,000,000 kilos, sugar 300,000 tons, cotton 90,000 tons, wheat 2,421,031 tons, rice 371,989 tons, and beans 326,826 tons. The live-stock in 1917 comprised 17,321,210 hogs, 8,443,400 cattle, 1,407,600 horses, 4,604,000 sheep, 351,900 mules, and 138,900 goats. The chief centers of foreign trade, and, with São Paulo, in the interior, the principal cities of the Republic, are Para, Pernambuco, Bahia, Porto Alegre, and Rio de Janeiro. The last named is the chief port.

The exports and imports of Brazil were as follows in the year 1918: Exports, \$284,275,000; imports, \$247,351,250. The exports were largest to the United States, totaling \$98,474,000. The exports to the United Kingdom were valued at \$28,700,500, and to Argentina \$43,188,250. The imports from the United States were valued at \$88,982,750. For the first seven months of 1919 the exports totaled 1,140,575 tons, amounting to a money value of 1,289,390,000 milreis; the imports were 1,708,103 tons, valued at 761,372,000 milreis.

Education.—Elementary education is free and in some of the states compulsory. There are about 13,000 schools with an attendance of 750,000. No university exists, though there are numerous normal, agricultural, commercial, and technical schools. There are many public libraries, that at Rio de Janeiro having over 400,000 volumes.

Defense.—Military service is universal between the ages of 21 and 45. Two years' service is required in the ranks, seven in the reserve, seven in the territorial army and eight in the national

guard. In 1918 the men available in the first line numbered 402,000 and in the second 493,000. The navy has two dreadnaughts, two protected cruisers, two coast defense ships of about 3,200 tons each, an almost obsolete protected cruiser, two river monitors, five torpedo gunboats, four first-class torpedo boats, three submarines, and ten destroyers. There are three naval arsenals.

Railways.—The total railway mileage is 30,101 kilometers, distributed among the various states as follows: São Paulo, 6,706; Rio de Janeiro, 3,131; Minas Geraes, 6,527; Rio Grande do Sul, 2,756; Pernambuco, 2,098; Bahia, 1,839; Matto Grasso, 1,168; Paraná, 1,064; Santa Catharina, 1,018; Ceara, 891; Para, 456; Espírito Santo, 652; Parahyba, 368; Alagoas, 364; Rio Grande do Norte, 313; Sergipe, 292; Federal District, 187; Goyaz, 179; Maranhao, 91; and Amazonas, 6. 15,251 kilometers are owned by the Federal Government, 2,464 kilometers by the state governments, and 10,051 by private companies.

Revenues.—The revenues and expenditures of the Government for 1919 were as follows, in milreis (a gold milrei representing 54.6 cents in United States money and a paper milrei 27.5 cents): Revenue, 113,533,434 gold; 502,989,000 paper. Expenditure, 80,369,827 gold; 476,641,194 paper.

For 1920 the budget estimates were 80,953,000 milreis gold and 526,953,000 milreis paper. The foreign indebtedness of the country was 116,434,274 pounds sterling; the internal debt was 1,012,137,000 milreis. The public wealth was figured at 30,000,000 contos (a conto equals 1,000 milreis), including these items: personal property, 7,000,000; improved property, 5,500,000; unimproved property, 10,000,000; railroads and ports, 2,000,000; live stock, 5,000,000; manufacturing industries, 500,000.

Government.—Executive authority is vested in a president whose term is four years and who is not eligible for re-election for a consecutive period. Legislative authority resides with the two chambers of the National Congress, the Senate and Chamber of Deputies. The former has 63 members, elected for nine years, and the latter 212 members, elected for a three-year term. The President in 1920 was Epitacio de Silva Pessoa, whose term expires in 1922. He visited the United States in 1919 after having served in Paris as one of the Brazilian delegates to the Peace Congress.

History.—It was only in 1531 that the Portuguese, busy as they were in India, here planted their first settlement. In

1578 Brazil fell, with Portugal itself, under the power of Spain, a connection which, besides being essentially detrimental, speedily threw it as a prey into the hands of the Dutch Republic, and, though Portugal regained its own independence in 1640, it was not until 1654 that Brazil was entirely recovered from the Hollanders, almost entirely by the efforts of her own soldiers through a war of more than 30 years. In 1807 the royal family of Portugal fled to Brazil; in 1815 the colony was declared a kingdom; and the Portuguese court having returned to Europe in 1821, a National Congress assembled at Rio de Janeiro, and on May 13, 1822, Dom Pedro, the eldest son of King João VI. of Portugal, was chosen "Perpetual Defender" of Brazil. He proclaimed the independence of the country on Sept. 7, 1822, and was chosen "Constitutional Emperor and Perpetual Defender," on Oct. 12th following. In 1831 he abdicated the crown in favor of his only son, Dom Pedro II., who reigned as Emperor until Nov. 15, 1889, when, by a revolution, he was dethroned, he and his family exiled, and Brazil declared a Republic, under the title of the United States of Brazil. In recent years Brazil's foreign policy has been of a most liberal character and efforts have been made to cement friendly relations with their neighbors in South America and with the United States. Her enlightened attitude during the World War and her prompt entrance into it by a declaration of war against Germany, following the example of the United States, resulted in friendly relations between the Allied Powers of Europe and Brazil. This was shown by a visit made to Brazil by the King and Queen of Belgium in September and October, 1919. Dr. Epitacio de Silva Pessoa was elected President on April 13, 1919, to succeed President Alvez who was elected in 1918 and who died in office. Dr. Pessoa, who was in Paris at the time of his election, acting as chief of the Brazilian delegation at the Peace Conference, visited the United States on his way to Brazil to take over the office of the presidency.

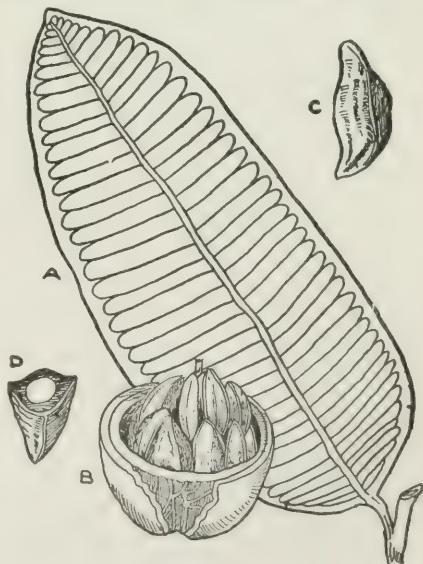
BRAZIL, a city of Indiana, the county-seat of Clair co. It is on the Central Indiana, the Chicago and Eastern Illinois, and the Vandalia railroads. Its chief industry is the mining of block coal. There are also manufactures of mining machines, pianos, wire, sewer pipe, etc. Large deposits of clay exist in the vicinity. It has a Carnegie library and other public buildings. Pop. (1910) 9,340; (1920) 9,293.

BRAZIL CABBAGE, or CHOU CARAÏBE, names somewhat vaguely applied to various species of *caladium* and *coccoloba* (natural order, *cracæ*), which yield edible tubers, and are largely cultivated in the tropics.

BRAZILETTO, an English name of *cæsalpinia*, a genus of leguminous plants constituting the typical one of the sub-order *cæsalpinieæ*. The narrow leaved braziletto, *C. sappan*, furnishes the sapan-wood used in dyeing red. *C. sepia*, the Mysore thorn, is so spinous that it constitutes an impenetrable fence. Hyder Ali planted it around fortified places. It is a scandent shrub. There are other species from the East or West Indies or South America.

BRAZILIAN GRASS, an incorrect popular name applied to a substance used in the manufacture of a very cheap kind of hats, known as Brazilian grass hats, and also as chip hats. It consists of strips of the leaves of a palm, *chamærops argentea*, which are imported into Great Britain for this manufacture, and chiefly from Cuba.

BRAZIL NUTS, the seeds of a Brazilian tree—the *bertholletia excelsa*. It belongs to the order *lecythidaceæ*. The



BRAZIL NUT

- A. Leaf.
- B. Fruit with half the pericarp removed.
- C. A single nut.
- D. Cross cut of nut.

nuts or seeds are largely exported from Para, whence they are sometimes called Para nuts. They are edible, besides

which they yield on pressure an oil used by watchmakers and artists.

BRAZIL TEA, a tree—the mate (*ilex paraguayensis*), the leaves of which are used in South America as a substitute for Chinese or India tea.

BRAZIL WOOD, a kind of wood used for dyeing, and extensively imported from the West Indies, Brazil, and other tropical countries. The best qualities of it are said to be produced by *cassalpinia echinata*. Other kinds are derived from the *C. brasiliensis* and *C. crista*. The former has timber which is elastic, tough and durable, and which takes a fine polish. It is of a fine orange color, full of resin, and yields by infusion a fine, full tincture.

BRAZING, the act of soldering together the surfaces of iron, copper, brass, etc., with an alloy composed of brass and zinc, sometimes with the addition of a little tin or silver.

BRAZOS, a large river of the United States, in Texas, rising in the N. W. part of the State, and flowing into the Gulf of Mexico, after a course of 900 miles, 40 miles W. S. W. of Galveston. During the rainy season, from February to May inclusive, it is navigable by steamboats for about 300 miles.

BRAZZA (brat'sa), an island in the Adriatic, part of Dalmatia, 24 miles long and from 5 to 7 broad, mountainous and well wooded. It produces good wines and oil, almonds, silk, etc. Pop. about 23,000.

BREACH, the aperture or passage made in the wall of any fortified place by the ordnance of the besiegers for the purpose of entering the fortress. Breaching batteries, are batteries of heavy guns intended to make a breach.

BREACH, in law, any violation of a law, or the non-performance of a duty imposed by law. Breaches are of various kinds:

1. Breach of close, i. e., of what is inclosed in fact or in the eye of the law. The entry into another man's land. (Blackstone's "Commentaries," bk. iii., ch. xii.)

2. Breach of covenant.—The violation of a written agreement. (Blackstone's "Commentaries," bk. iii., ch. ix.)

3. Breach of duty.—Violation of the duty incumbent upon one rightly to discharge the functions imposed upon him by the office or trust which he holds. (Blackstone's "Commentaries," bk. iii., ch. ix.)

4. Breach of the peace.—Offenses

against the public, involving personal violation of the peace, or incitement or provocation to others to do so. (Blackstone's "Commentaries," bk. iv., ch. xi.)

5. Breach of pound.—The act of breaking into a pound, or any similar place, to rescue one's cattle or other property there inclosed. (Blackstone's "Commentaries," bk. iii., ch. ix.)

6. Breach of prison—Escape of a prisoner from prison by breaking the building or in any other way. (Blackstone's "Commentaries," bk. iv., ch. x.)

7. Breach of promise.—(a) General.—Violation of one's pledged word, especially if the promise be written down. (b) Special.—Breach of promise of marriage. An action lies for it on the part of either man or woman, though, as a rule, only the latter is believed to be substantially injured or deserve damages.

8. Breach of trust.—The violation of one's duty as trustee, or anything similar.

BREAD, the flour or meal of grain kneaded with water into a tough and consistent paste and baked. There are two kinds of bread, leavened and unleavened. Leavened, or fermented bread, is prepared by mixing together certain quantities of flour, warm water, salt and yeast, or leaven.

Leaven, which is now seldom used in this country is a mixture of flour, potatoes and water, kept in a warm place till it begins to ferment.

Unleavened, or unfermented, bread, is of two kinds. In the one, flour and water only are used, and this produces a heavy and compact bread. In the other, an acid and a carbonate are added for the purpose of disengaging carbonic acid gas, which, in imitation of yeast, raises the dough and renders the bread light and porous. The substances used are carbonate of ammonia or carbonate of soda, in combination with hydrochloric or tartaric acids.

Aerated bread is prepared by forcing pure carbonic acid gas into the dough contained in a strong iron vessel. When this carbonated dough is introduced into the oven the gas expands and escapes, leaving the bread light and porous. Graham bread is ordinary white bread with from 15 to 20 per cent. of fine bran.

Whole meal bread, made from unsifted ground wheat, is the only true Graham bread, being richer in nutrients than white bread. The amount of nitrogenous matter in white bread varies from 5 to 8 per cent., while in whole meal bread it rises to 14 per cent.

Brown bread is bread made of a mixture of wheaten, or rye flour, an Indian corn meal. It is sometimes sweetened.

"Pumpernickel" is a German cant name for *schwarzbrod* = black bread, made of rye flour and flavored with anise or fennel seeds. It is the common bread of the mass of the German speaking peoples.

BREADALBANE, a Highland district in the W. part of Perthshire, in the center of the Grampians. It gives its title to the Marquis of Breadalbane, head of a branch of the Campbell family, who is the chief proprietor here.

BREAD FRUIT, the fruit of the tree described below. It is about the size and shape of a child's head. The surface is reticulated; the skin is thick, the eatable part lying between it and the



BREAD FRUIT

core. The latter is snow white, and about the same consistence as new bread. It is first divided into three or four parts, and then roasted, or it may be taken boiled, or fried in palm oil. It is extensively used in the South Sea Islands and elsewhere.

BREAD FRUIT TREE, the English name of *artocarpus incisa*, a tree of the order *artocarpaceæ*. It has pinnatifid leaves with sinuations, while the allied jackfruit, *artocarpus integrifolia*, as its name imports, has them, as a rule, entire. For the fruit of the bread tree see above. The wood is useful; the inner bark may

be made into cloth; the male catkins serve for tinder, and the juice for bird-lime, or as a cement for broken crockery. The tree grows in the South Sea Islands and in the East Indies. From the former place it was introduced into the West Indies, in 1793, and thence to South America.

BREAD NUT, the English name of *brosimum*, a genus of plants doubtfully placed at the end of the *urticaceæ* (nettlesworts). The fruit of the *B. alicastrum*, or Jamaica bread nut, tastes like chestnut, and has been used to sustain negroes and others during times of scarcity.

BREAD RASP, a rasp used by bakers in removing the burnt crust of loaves and rolls, especially of French rolls.

BREAD ROOM, a room or portion of the hold of a ship separated from the rest, and designed to furnish a place for the bread and biscuit on board.

BREAD ROOT, the English name of the *psoralea esculenta*, a papilionaceous plant with quinate leaves and dense axillary spikes of flowers. It is found in the Rocky Mountain regions. Its roots are sweet and nutritious, and are eaten like potatoes.

BREADTH, a term used by painters and critics to indicate that artistic quality which gives concentration, repose and harmony of effect to a picture. In a work distinguished by breadth, the individual component parts do not force themselves unduly upon the spectator, the eye is not tempted to wander aimlessly from point to point of the canvas. The portraits and figure pieces of Rembrandt are typical and unsurpassable examples.

BREAKWATER, a pier, wall, mole, sunken hulk, or anything similar, placed at the entrance of a harbor, at the exposed part of an anchorage, or in any such situation, with the view of deadening the force of the waves which roll in from the ocean. There are several notable breakwaters in this country—one of the longest and most notable being that in Lake Michigan, protecting the harbor of the city of Chicago. The Delaware breakwater in Delaware Bay, is built with sloping sides, being much broader at its base than on top. Other notable breakwaters are those at Cherbourg, France, and Plymouth, England.

BREAM, the carp bream, *abramis brama*. It is of a yellowish white color, which changes, through age, to a yellowish brown. The sides are golden, the cheeks and gill covers silver white, the

fins, light colored, tinged, the ventral one with red and others with brown. It is found in deep waters and lakes. It is sought after by anglers, who however, consider the flesh insipid. Also the English name of the several fishes belonging to the family *cyprinidae* and the genus *abramis*. The best known species are: (1) The bream or carp bream (*A. brama*), already described; (2) the white bream, or breamflat (*A. blicca*); and, (3) the Pomeranian bream (*A. bugnenhagii*). The species are found in this country and in Europe, but are of little value as food.

BREAST, FEMALE, or mammary gland, consists of a series of tubes radiating from a common center, the nipple of which is situated in an areola or dark colored patch. On the surface of the latter are several (from 4 to 10) sebaceous glands, which secrete an unctuous fluid to protect the skin of the nipple, which is very thin, from the saliva of the sucking infant. The milk tubes (15 or 18 in number) enlarge into sinuses, and pass each to a separate lobe or subdivision of the breast, where they divide into twigs and branches (the lactiferous ducts), which end in minute vesicles. The lobes are held together by fibrous tissue, and are well packed in fat, which increases sometimes to an enormous extent the apparent size of the organ.

BREASTWORK, in fortification, a hastily constructed parapet made of material at hand, such as earth, logs, rails, timber, and designed to protect troops from the fire of an enemy. In architecture, the parapet of a building. In shipbuilding, a railing or balustrade standing athwartships across a deck, as on the forward end of the quarter-deck or roundhouse. The beam supporting it is a breastbeam.

BREATH, the air which issues from the lungs through the mouth and nostrils. For details regarding the organic machine on the action of which breathing depends, see LUNG. For the process of breathing itself see RESPIRATION. From 350 to 400 cubic feet of air are drawn into the lungs in 24 hours. The air expired is different, both in volume and composition, from that which was inspired. Each hour an adult man takes in 450 to 550 grains of oxygen, and emits in the same period about 632 grains of carbonic acid, about 45 to 50 grains of nitrogen, and 9,720 grains of watery vapor. Hence a continued supply of fresh air, laden with oxygen, is needful to maintain life.

BRECCIA (bretch'ya), a kind of marble composed of a mass of angu-

lar fragments, closely cemented together in such a manner that when broken they form *bréches* or notches. In geology, the word has now a more extended signification. It signifies a rock composed of angular as distinguished from rounded fragments united by a cement of lime, oxide of iron, etc. There are quartzite breccias, ferruginous breccias, volcanic breccias, bone breccias, etc.

BRÉCHE DE ROLAND (brâsh' de rô-lân'), that is, "the breach of Roland," a mountain pass in the Pyrenees, between France and Spain, which, according to a well known legend, was opened up by Roland, one of the paladins of Charlemagne, with one blow of his sword Durandal, in order to afford a passage to his army. It is an immense gap in the rocky mountain barrier 43 miles to the N. of Huesca.

BRECKINRIDGE, JOHN CABELL, Vice-President of the United States, born near Lexington, Ky., Jan. 21, 1821; practiced law in Lexington until 1847, when he was chosen major of a volunteer regiment for the Mexican War. He sat in Congress in 1851-1855, and in 1856 was elected Vice-President, with James Buchanan as President. In 1860 he was the pro-slavery candidate for the presidency, but was defeated by Abraham Lincoln. A United States Senator from March to December, 1861, he then entered the Confederate army, was appointed a Major-General, in 1862, and held some important commands during the Civil War. He was Secretary of War, in Jefferson Davis' cabinet, at the close of the struggle, and escaped to Europe, whence he returned in 1868. He died in Lexington, May 17, 1875.

BRECKINRIDGE, JOSEPH CABELL, an American military officer, born in Baltimore, Md., Jan. 14, 1842; a nephew of Gen. John C. Breckinridge of the Confederate army. He practiced law in Danville, Ky., till the beginning of the Civil War, when he joined the Union army. He was made a First Lieutenant in the Regular army Aug. 1, 1863, a Captain in 1874, Brigadier in 1889, and Major-General U. S. A., Feb. 18, 1898. He served in the Santiago campaign, Inspector-General U. S. A., 1899-1903. He was retired in 1903, after 40 years of service.

BREDA (brâ'da), a town in Holland, province of North Brabant, at the confluence of the Merk and the Aa. Breda was once a strong fortress and of great military importance as a strategical position. From the 16th to the end of the 18th century Breda has an interesting military history of sieges, assaults and captures, with which the names of the

most famous generals of their time, the Duke of Parma, Maurice of Orange, the Marquis Spinola, Dumouriez, and Pichegru, etc., are connected. It was the residence for a time of the exiled Charles II. of England, and it was in the Declaration of Breda that he promised liberty of conscience, a general amnesty, etc., on his restoration. Pop. about 28,000.

BREECH, in firearms and ordnance, the rear portion of a gun; the portion behind the chamber; in shipbuilding, the outer angle of a knee timber; the inner angle is the throat.

BREECHES, a garment worn by men, covering the hips and thighs, and reaching to the knees. (Pantaloons, or trousers, are sometimes erroneously given this name.)

BREECHES BIBLE, a name given to a Bible printed in 1579; and so called from the reading of Gen. iii: 7: "They sowed figge tree leaves together and made themselves breeches." Wyclif's version contains the same words.

BREECH LOADER, a firearm in which the charge is introduced at the rear instead of at the muzzle. The use of breach loaders goes back to the 16th century; indeed, it is probable that that form of arm is about as old as the muzzle loader.

BREECH LOADING, made to be loaded at the breech. Breech-loading gun or cannon, a gun or cannon made to be loaded at the breech instead of the muzzle.

BREECH PIN, in firearms, a plug screwed into the rear end of a barrel, forming the bottom of the charge chamber. Otherwise called a breech plug or breech screw.

BREECH SCREW, in firearms, the plug which closes the rear end of the bore of a firearm barrel. The parts are known as the plug, the face, the tenon, the tang, and the tangscrew hole.

BREECH SIGHT, the hinder sight of a gun. In conjunction with the front sight, it serves to aim the gun at an object. It is graduated to degrees and fractions, their length on the scale being equal to the tangents of an arc having a radius equal to the distance between the front and rear sights. The front sight is merely a short piece of metal screwed into the gun, usually at the muzzle, but sometimes between the trunnions, or on one of the rimbases, with its upper edge parallel to the bore of the gun. The rear sight may be detached, having a circular base fitting the base of the gun,

or may slide through a slotted lug, and be retained at any given height by a set screw. The breech sight, the tangent scale and the pendulum are merely different forms of this device.

BREEDE (bra-dá'), a river in Cape Colony, rises in the Warm-Bokkeveld, and flows chiefly in a S. E. direction through the district of Zwellendam, entering the Indian Ocean at St. Sebastian's Bay, about 60 miles N. E. of Cape Agulhas, the most southerly point of Africa.

BREEDING, the art of improving races or breeds of domestic animals, or modifying them in certain directions, by continuous attention to their pairing, in conjunction with a similar attention to their feeding and general treatment. The sum of desirable qualities in particular races has been increased in two ways. Individual specimens are produced possessing more good qualities than can be found in any one specimen of the original stock; and from the same stock many varieties are taken characterized by different perfections. When, however, an effort is made to develop rapidly, or to its extreme limit, any particular quality, it is always made at the expense of some other quality, or of other qualities generally, by which the intrinsic value of the result is necessarily affected. High speed in horses, for example, is only attained at the expense of a sacrifice of strength and power of endurance. So the celebrated merino sheep are the result of a system of breeding which reduces the general size and vigor of the animal, and diminishes the value of the carcass. Much care and judgment, therefore, are needed in breeding, not only in order to produce a particular effect, but also to produce it with the least sacrifice of other qualities.

BREED'S HILL, a slight elevation in the Charlestown district of Boston, Mass., about 700 yards from Bunker Hill. Although the famous engagement of June 17, 1775, is known as the Battle of Bunker Hill, most of the fighting was done on Breed's Hill. Here was located the American redoubt, against which the British made their three historical charges, and here Warren fell. The Bunker Hill monument stands on Breed's Hill.

BREHON LAWS, designation of the ancient laws of the Irish, from an Irish word signifying judges. It is supposed that some of the written collections of these laws, which still exist, are of great antiquity; as old, perhaps, as the earlier ages of the Christian era. Prior to the

Anglo-Norman invasion, Ireland was governed by these laws.

BREISACH (bri'säch), **ALT**, a town of Baden, on an isolated basalt hill (804 feet) on the right side of the Rhine, 14 miles W. of Freiburg. The Mons Brisiacus of Cæsar, it was taken by Ariovistus when he invaded Gaul; being regarded as the key to western Germany, it figured prominently in the wars of the 17th and 18th centuries. The minster is a 13th century structure. Neu Breisach, on the other side of the Rhine, in Alsace, was built by Louis XIV., in 1697, when Alt Breisach was given back to the Empire.

BREISGAU (brīs'gou), one of the most fertile and picturesque districts of Germany, in the S. of Baden, in the Rhine valley, containing part of the Black Forest. Chief town, Freiburg.

BREITENFELD (bri'ten-feld), a village of Saxony, 5 miles N. of Leipsic, remarkable for three battles fought in its neighborhood. In the first, fought on Sept. 17 (old style, 7th), 1631, Gustavus Adolphus inflicted a decisive defeat upon the imperialists under Tilly, who, as well as his generals, Pappenheim and Fürstenberg, was wounded. The second battle was also a victory of the Swedes under Torstenson over the imperial forces under the Archduke Leopold and Piccolomini, Nov. 2 (old style, Oct. 23), 1642. The third battle was one act of the great "Battle of the Nations" at Leipsic, Oct. 16, 1813.

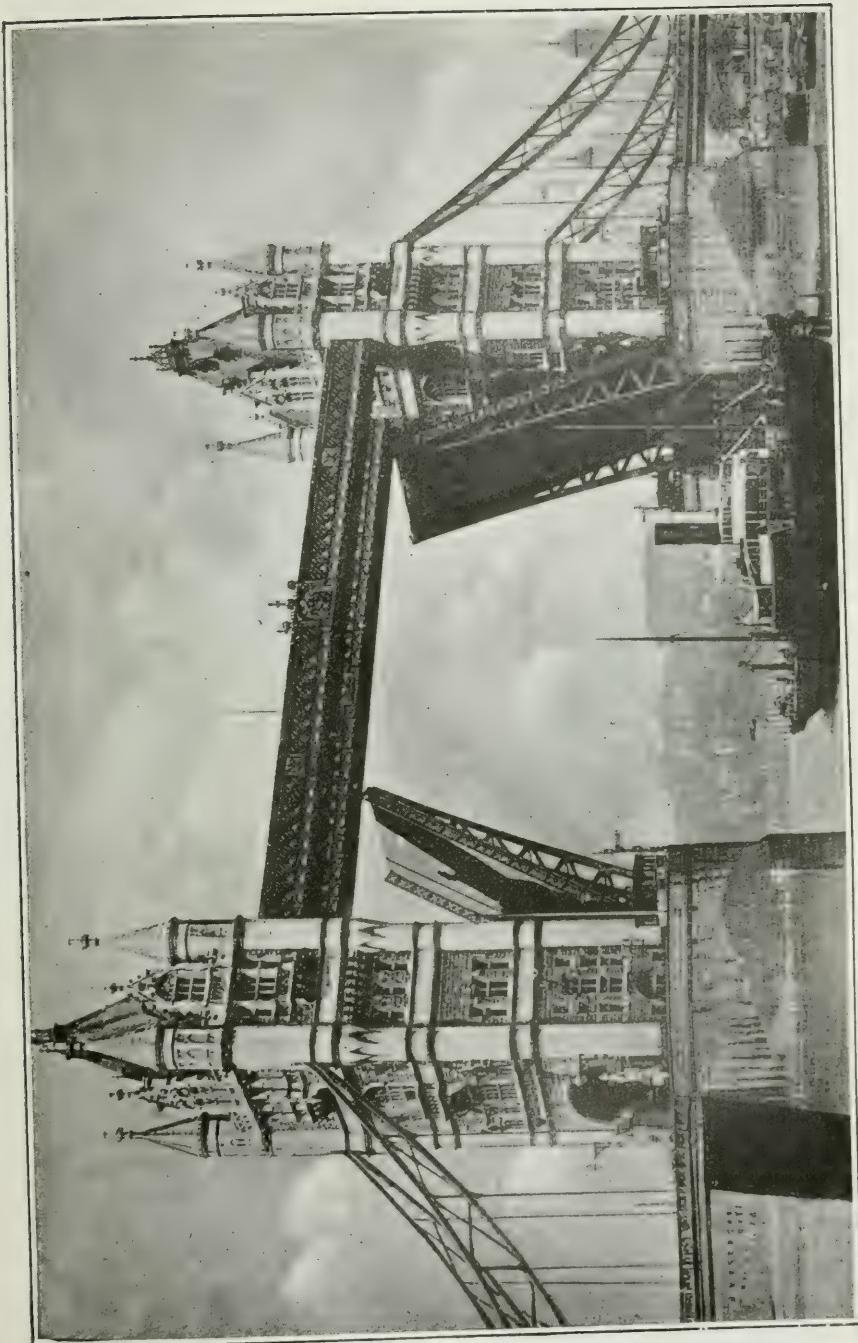
BREMEN (brā'men), a city of Germany, formerly an independent member of the Empire, one of the three Hanse towns, on the Weser, about 50 miles from its mouth, in its own small territory of 99 square miles, besides which it possesses the port of Bremerhaven, at the mouth of the river. The city is partly on the right, partly on the left, bank of the Weser, the larger portion being on the former. It contains the cathedral, founded about 1050, the old Gothic Council house, with the famous wine cellar below it, the Town Hall, the Merchants' House, and the Old and the New Exchange. The Vorstadt, or suburbs, lying on the right bank, outside the ramparts of the old town, are extensive. The manufacturing establishments consist of tobacco and cigar factories, sugar refineries, rice mills, iron foundries, machine works, rope and sail works, and shipbuilding yards. Its situation renders Bremen the emporium for Hanover, Brunswick, Hesse, and other countries traversed by the Weser, and next to Hamburg it is the principal seat of the

export and import and emigration trade of Germany. Only small vessels can pass up to the city itself; the great bulk of the shipping trade centers in Bremerhaven and Geestemünde. Bremerhaven has docks capable of receiving the largest vessels, and is connected by railway with Bremen. The chief imports are tobacco, raw cotton and cotton goods, wool and woolen goods, rice, coffee, grain, petroleum, etc. Pop. with Bremerhaven, about 248,000.

Bremen was made a bishopric by Charlemagne about 788, was afterward made an archbishopric, and by the end of the 14th century had become virtually a free imperial city. The present constitution is in most respects republican and was adopted in 1854. The legislative authority is shared by a Senate of 18 citizens, elected for life, and an assembly of 150 citizens, elected for 6 years. The executive lies with the Senate and Senatorial committees.

BREMER, FREDRIKA (brā'mer), a Swedish novelist, was born at Tuorla, Finland, Aug. 17, 1801; was brought up at Arsta, about 20 miles from Stockholm. In 1828 appeared the first volume of her "Sketches of Everyday Life," but the second volume, "The H. Family" (1833; English translation, 1844), first revealed her power. From this time she devoted herself to writing stories and varied her literary labor by long journeys in Italy, England, the United States, Greece, Palestine, which supplied the materials for her "Homes of the New World" (1853), and "Life in the Old World" (1862). On her return to Sweden she gave herself up to philanthropy, but more particularly to the education and emancipation of women, and the consequent propagandist character of her later novels, "Bertha," and "Father and Daughter" (1859), was detrimental in no small degree to their literary value. She has been called the Jane Austen of Sweden. Of her stories perhaps the most perfect is "The Neighbors" (1837). "The Diary," "The President's Daughters," "Brothers and Sisters," and "Strife and Peace," are only less popular. She died in Arsta, Dec. 31, 1865.

BREMERHAVEN (brā'mer-häf-en), the port of Bremen, Germany, on the E. shore of the Weser estuary, nearly 10 miles from the open sea, and 39 N. N. W. of Bremen. It was founded by Bremen, in 1827, on ground acquired from Hanover, and rapidly became a thriving place. It has an excellent system of docks. The Geeste separates Bremerhaven from Geestemünde. Pop. about 30,000.



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TOWER BRIDGE OVER THE THAMES, LONDON, ENGLAND, AS IT APPEARS WHEN A VESSEL IS PASSING THROUGH
Enc. Vol. 2—p. 164



BROOKLYN BRIDGE AND THE NEW YORK SKY LINE

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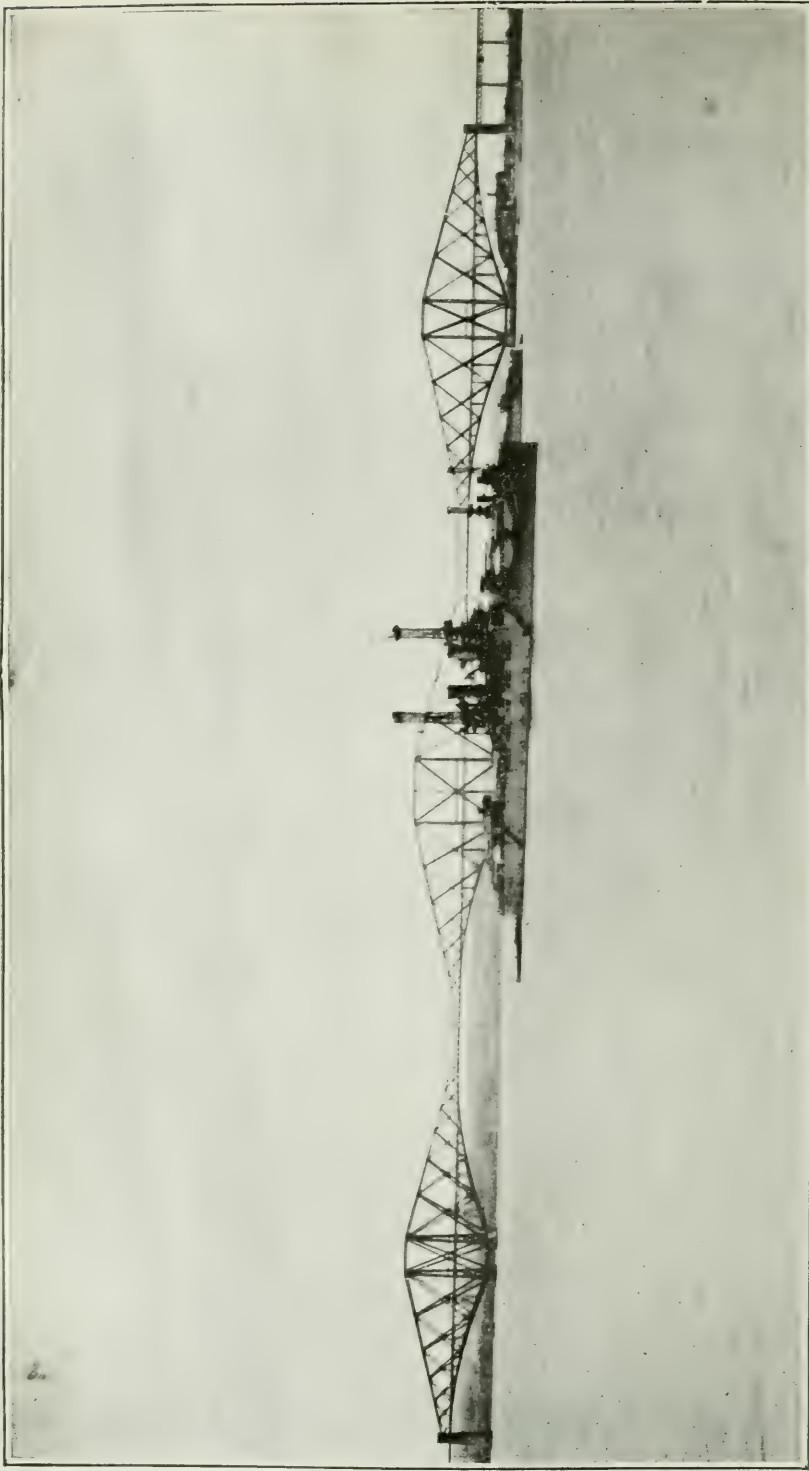
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HELL GATE BRIDGE, OVER EAST RIVER, NEW YORK CITY



©Ewing Galloway

THE STEEL SUSPENSION BRIDGE AT NIAGARA FALLS

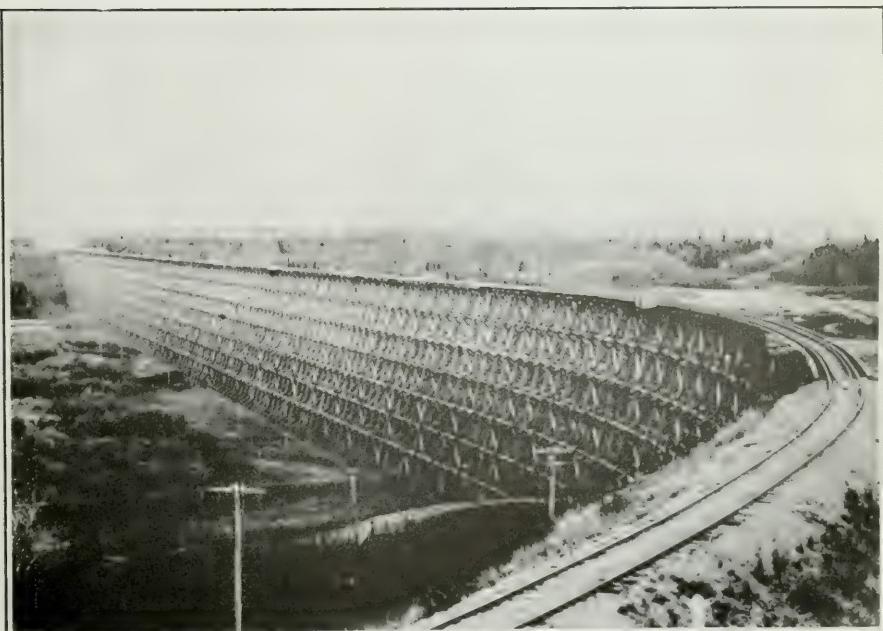


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THE FIRTH OF FORTH CANTILEVER BRIDGE. THE PICTURE WAS MADE DURING THE WORLD WAR AND SHOWS AMERICAN BATTLESHIPS



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QUEBEC BRIDGE OVER THE ST. LAWRENCE



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DUHAMEL BRIDGE, BATTLE RIVER VALLEY, CANADA



RAILROAD BRIDGE ACROSS THE OHIO RIVER AT HENDERSON, KY.

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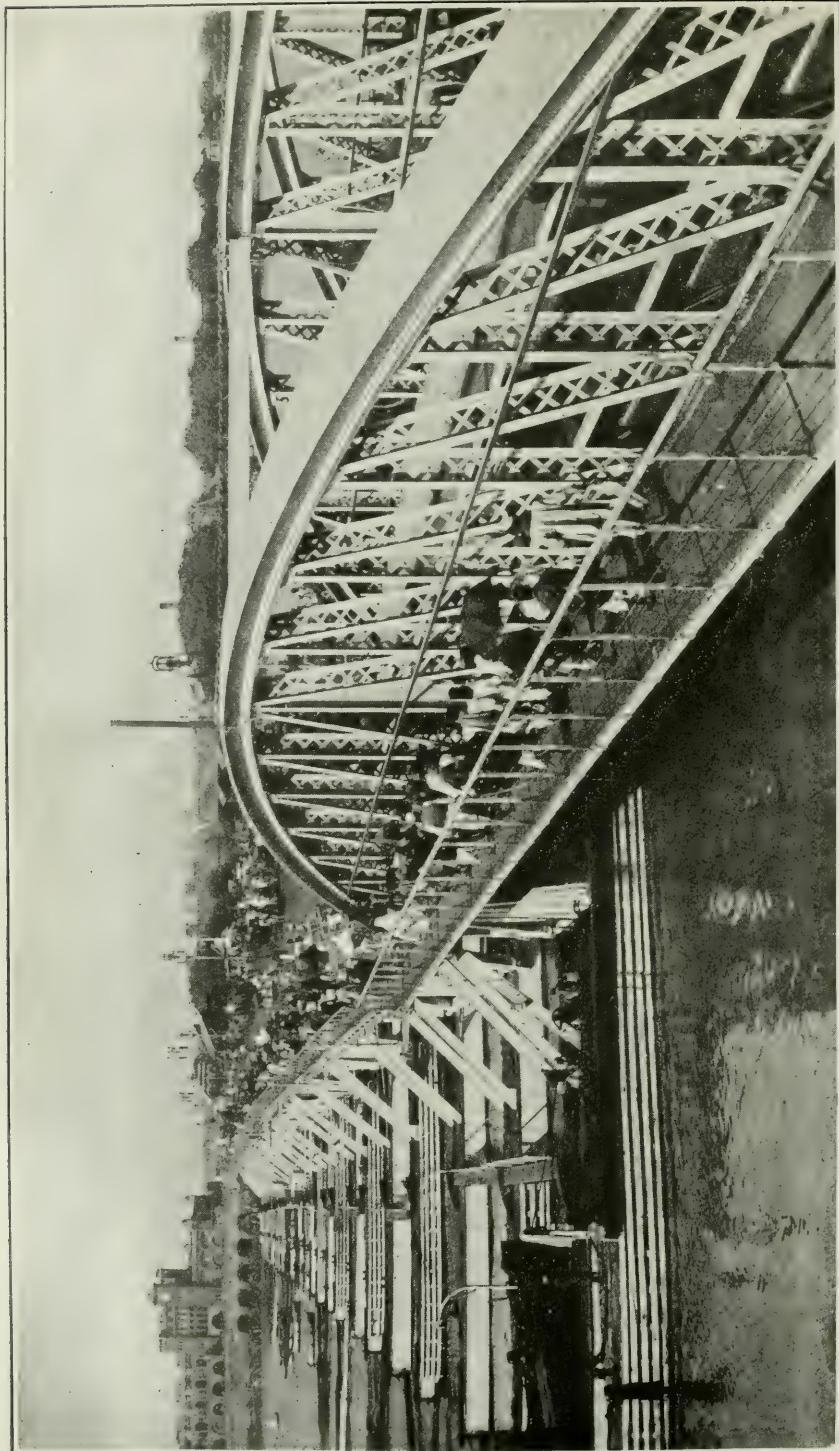
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TWO ORE BRIDGES FOR LOADING AND UNLOADING ORE, LIMESTONE, AND COKE,
BETHLEHEM, PA.



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A BRIDGE OVER THE NILE, NEAR CAIRO, SWINGING OPEN TO LET BOATS PASS



THE BRIDGE OVER THE HOOGHLY RIVER AT CALCUTTA, INDIA

© Publishers' Photo Service

BREMERTON, a city of Washington, in Kitsap co. It is on Puget Sound and is on the line of the Washington Steamship Company. The city is the seat of the Puget Sound navy yard, which occupies nearly 250 acres and has been equipped at a cost of \$10,000,000. It was the scene of great activity during the World War. The city has a municipal park, a playground, a public library, theaters, and other public buildings. Its industries include machine shops, cigar factories, sheet metal works, etc. Pop. (1910) 2,993; (1920) 8,918.

BRENNER, a mountain in the Tyrolean Alps between Innsbruck and Sterzing; height, 6,777 feet. The road from Germany to Italy, traversing this mountain, reaches the elevation of 4,658 feet, and is one of the lowest roads practicable for carriages over the main chain of the Alps. A railway through this route was opened in 1867.

BRENNUS, the name of two individuals known in history. (1) The first was the hero of an early Roman legend, which relates to the migration of the Gauls into Italy and their march to Clusium and Rome. In the account given by Livy v. 33, etc.), he figures as the Regulus Gallorum, or chieftain of the Gauls. When he arrived at Clusium, the inhabitants called on the Romans for aid. He engaged with and defeated the Romans on the banks of the Allia, the name of which river they ever after held in detestation. (Vergil's "Æneid," vii, 717). The whole city was afterward plundered and burned, and the capitol would have been taken but for the bravery of Manlius. At last, induced by famine and pestilence, the Romans agreed that the Gauls should receive 1,000 pounds of gold, on the condition that they would quit Rome and its territory altogether; the barbarian brought false weights, but his fraud was detected. The tribune Sulpicius exclaimed against the injustice of Brennus, who immediately laid his sword and belt in the scale, and said, "Woe to the vanquished." The dictator, Camillus, arrived with his forces at this critical time, annulled the capitulation, and ordered him to prepare for battle. The Gauls were defeated; there was a total slaughter, and not a man survived to carry home the news of the defeat. The date of the taking of Rome, assigned by Niebuhr, is the 3d year of the 39th Olympiad, 382 B. C. (2) A king of the Gauls, who, 279 B. C., made an irruption into Macedonia with a force of 150,000 men and 10,000 horse. Proceeding into Greece, he attempted to plunder the temple at Delphi. He en-

gaged in many battles, lost many thousand men, and himself received many wounds. In despair and mortification he killed himself.

BRENTA, a river in north Italy, falling, after a winding course of 112 miles, into the Adriatic. Formerly its embouchure was at Fusina, opposite Venice; but a new course was made for it.

BRENTFORD, county town of Middlesex, England, 7 miles W. of London; with saw mills, pottery works, foundries, etc. Here Edmund Ironside defeated Canute in 1016; and Prince Rupert, Colonel Hollis, in 1642. Pop. about 17,000.

BRENT GOOSE (*anser brenta* or *bernicla*), a wild goose, smaller than the common barnacle goose and of much darker plumage, remarkable for length of wing and extent of migratory power, being a winter bird of passage in France, Germany, Holland, Great Britain, the United States, Canada, etc. It breeds in high northern latitudes; and is considered the most delicate for the table of all the goose tribe.

BRENZ, JOHANN, the Reformer of Württemberg, born in Weil, Suabia, June 24, 1499, and went in his 13th year to study at Heidelberg. From Luther's visit to Heidelberg in 1518 he became his zealous adherent. He was at the Marburg Disputation in 1529, and the Diet of Augsburg in 1530, and in 1536 was summoned by Duke Ulrich to Württemberg to lead the Reformation there. For his energetic opposition to the interim of Charles V. he was forced to flee to Stuttgart, where, in 1553, he became "prost" (or superintendent). Brenz was co-author of the "Württemberg Confession of Faith," and his "Catechism" (1551) has held the next place to that of Luther in Protestant Germany. He died in Stuttgart, Sept. 11, 1570.

BRESCIA (bresh'chē-a), a city of north Italy, capital of the province of the same name, is beautifully situated at the foot of the Alps, and is of a quadrilateral form, about 4 miles in circuit. Among its chief edifices are the new cathedral, a handsome structure of white marble, begun in 1604, the Rotunda, or old cathedral, the town hall (La Loggia), and the Broletto, or courts. The city contains a museum of antiquities, picture gallery, botanic garden, etc. Near the town are large iron works, and its firearms are esteemed the best that are made in Italy. It has also silk, linen, and paper factories, tan yards, and oil mills, and is an important mart for raw silk. Brescia was the seat of a school of painting of great merit, including Ales-

sandro Bonvicino, commonly called Il Moretto, who flourished in the 16th century. The city was originally the chief town of the Cenomanni, and became the seat of a Roman colony under Augustus about 15 B. C. It was burned by the Goths in 412, was again destroyed by Attila, was taken by Charlemagne in 774, and was declared a free city by Otho I. of Saxony in 936. In 1426 it put itself under the protection of Venice. In 1796 it was taken by the French, and was assigned to Austria by the Vienna Treaty of 1815. In 1849 its streets were barricaded by insurgents, but were carried by the Austrians under General Haynau. It was ceded to Sardinia by the Treaty of Zürich, 1859. Pop. about 88,400. The province has an area of 1,845 square miles; pop. about 540,000.

BRESLAU (*bres'lou*), a city of Prussia, capital of the province of Silesia, at the confluence of the Ohlau with the Oder, 190 miles S. E. of Berlin, comprising various suburbs, some of them built on islands of the Oder, and united to the body of the town by numerous bridges. It is the center of a very extensive commerce. The fair held here in June for the sale of wool is the greatest of its kind in Germany. Breslau prior to the World War was one of the most animated and prosperous cities in Prussia. Breslau was taken from Austria by Frederick the Great. Pop. about 514,000.

BREST, a seaport in the N. W. of France, department of Finisterre. It has one of the best harbors in France, and is the chief station of the French marine, having safe roads capable of containing 500 men-of-war in from 8 to 15 fathoms at low water. The entrance is narrow and rocky, and the coast on both sides is well fortified. The design to make it a naval arsenal originated with Richelieu, and was carried out by Duquesne and Vauban in the reign of Louis XIV., with the result that the town was made almost impregnable. Brest stands on the summit and sides of a projecting ridge, many of the streets being exceedingly steep. Several of the docks have been cut in the solid rock, and a breakwater extends far into the roadstead. The manufactures of Brest are inconsiderable, but it has an extensive trade in cereals, wine, brandy, sardines, mackerel, and colonial goods. It is connected with the United States by a cable terminating near Duxbury, Mass. The English and Dutch were repulsed at Brest in 1694. In 1794 it was blockaded by Howe, who won a great victory off the coast over the French fleet. Pop. about 91,000. Brest during the World War (1914-1918)

became a great naval port of entry for the ships of the Allies—one of the chief ports of disembarkation in France for the Allied troops.

BREST-LITOVSK (Polish BRZESC), a strongly fortified town of the province of Grodno (Russian Poland), on the Bug; commands the intersection of several important railways, being 132 miles E. S. E. of Warsaw, and 682 miles W. S. W. of Moscow. The town has vast magazines and military stores, and an extensive trade in its cloth manufactures, Russian leather, soap, and wood. Once the occasional residence of the Kings of Poland, it is now the seat of a Greek and an Armenian Catholic bishop. It fell to Russia in 1795. Pop. about 55,000.

BREST-LITOVSK, TREATY OF, the agreement that ended the war between Russia and the Central Powers, March 3, 1918. The event had been foreshadowed by the complete military collapse of Russia, and the coming into power of the Bolshevik régime. Plenipotentiaries of both Powers met in the town from which the treaty takes its name Dec. 22, 1917. Previous to that time an armistice had been signed that was to last from Dec. 17, 1917, to Jan. 14, 1918. The terms of peace suggested by the Russian delegates had as their fundamental principle no annexations nor indemnities and free self-determination of peoples. They also demanded that all the issues of the war, such as Alsace-Lorraine and others be embraced in the settlement. The Germans countered with a demand for the severance of Poland and large portions of the Baltic states from Russian control, and a series of humiliating commercial conditions, that would make Russia a field for German exploitation. A time limit of ten days was allowed for the Entente to join in the negotiations, should they so desire. No such wish being expressed by them within that time, the conference proceeded solely on the questions at issue between Russia and the Central Powers. The terms laid down by the latter were declared entirely unacceptable by the Russians. They asserted that the whole of Russia, as it then existed, must be evacuated by the German armies before peace could be concluded. This proposition was declined, and the proceedings reached an impasse. Several adjournments were taken from time to time, but the discussions still proved fruitless. On February 9 the representatives from the Ukraine signed a separate peace with the Central Powers. On February 10 Trotzky issued a statement on behalf of

the Russian delegates, in which, while still refusing to accept the enemy's terms, he declared that they regarded the war as ended without a treaty. He added that an order had been issued for the entire demobilization of Russian troops, and that as far as Russia was concerned there would be no more fighting. The German Foreign Minister, Von Kuehlmann, threatened to renew military operations if the treaty were not signed. This threat was made good as soon as the armistice expired on February 18. The whole German line advanced, and the Soviet authorities were thrown into a panic. On February 19 it was voted to accept the terms unconditionally as a matter of *force majeure*. But Germany was not now willing to limit herself to the original proposals, and, on February 23, announced more drastic terms, which must be accepted by Russia within forty-eight hours and signed within three days, ratification to follow within two weeks. The Soviet authorities, now thoroughly cowed, agreed, and a new delegation was sent to Brest-Litovsk, where the treaty was signed March 3, 1918.

The terms of the treaty were sweeping and practically dismembered Russia, taking from her a fourth of her European territory and a third of her population. The provinces she lost were the richest, most fertile, and most progressive. Poland, Lithuania, Finland, Courland, Estonia, and Livonia, though they were recognized nominally as independent and self-determining, passed virtually under German control. Russia's territorial and economic losses embraced 301,000 square miles of land, 56,000,000 inhabitants, more than 13,000 miles of railway, 89 per cent. of her coal production and 73 per cent. of the iron output. The lost territory had formerly yielded an annual revenue of nearly \$425,000,000.

The Entente denounced the treaty as shameful and iniquitous and refused to recognize it. The self-determination accorded nominally to the severed provinces of Russia was denounced as a sham. "Why waste time," asked the Premiers of Great Britain, France, and Italy, in a joint statement issued March 18, 1918, "over Germany's pledges, when we see that at no period in her history of conquest—not when she overran Silesia nor when she partitioned Poland—has she exhibited herself so cynically as a destroyer of national independence, the implacable enemy of the rights of man, and the dignity of civilized nations."

"Peace treaties such as these we do not and cannot acknowledge. Our own ends are very different. We are fight-

ing and mean to continue fighting, in order to finish once for all with this policy of plunder and to establish in its place the peaceful reign of organized justice."

Denunciation quite as strong was uttered by President Wilson on behalf of the United States. The pledges of the Allies were kept, and one of the conditions of the peace treaty, signed on June 28, 1919, was that the treaty of Brest-Litovsk stood annulled.

BRETAGNE (*bre'tān*) or **BRITANY**, one of the provinces into which France was divided. It now forms the departments of Finistère, Côtes-du-Nord, Morbihan, and Loire-Inférieure. In ancient times, under the name of Armorica, it was the central seat of the confederated Armorican tribes, who were of Celtic and Kymric origin. Traces of them still remain in the old Kymric dialect of the three most westerly departments, and in the numerous so-called Druidical monuments. The Breton has generally a tinge of melancholy in his disposition; but often conceals, under a dull and indifferent exterior, lively imagination and strong feelings. Under the Romans, the country, after 58 B. C., was made the *Provincia Lugdunensis Tertia*; but its subjugation was hardly more than nominal, and it was entirely liberated in the 4th century, when it was divided into several allied republican states, which afterward were changed into petty monarchies. Bretagne became subject to the Franks in the reign of Charlemagne, and was handed over by Charles the Simple to the Northmen in 912. After some fierce struggles, the Bretons appear to have at length acknowledged the suzerainty of the Norman dukes. Geoffroi, Count of Rennes, was the first to assume the title of Duke of Bretagne in 992. The Duchy of Bretagne was incorporated with France in 1532, by Francis I., to whom it had come by marriage, and subsequently shared in the general fortunes of the Empire, but retained a local parliament until the outbreak of the Revolution. During the Revolution, Bretagne, which was intensely loyal, was the arena of sanguinary conflicts, and especially of the movements of the Chouans, who reappeared as recently as 1832.

BRETHREN OF THE FREE SPIRIT, a sect which first attracted notice in the 11th century. By Mosheim it is identified with the Paulicians and the Albigenses, the Beghardæ, the Beghinæ, the Adamites, and Picards. In the 13th century they spread themselves over Italy, France, and Germany.

They are alleged to have derived their name from Rom. viii: 2-14. They were treated with great severity both by the Inquisition and by the Hussites.

BRETHREN OF THE HOLY TRINITY, a fraternity of monks who lived in the 13th century.

BRETHREN OF THE SACK, a fraternity of monks who lived in the 13th century.

BRETHREN OF THE STRICT OBSERVANCE, the stricter Franciscans, or Regular Observatines.

BRETIGNY (bre-tēn-yē), a village of France, in the department of Eure-et-Loire. By the treaty of Bretigny, May 8, 1360, between Edward III. of England and John II. of France, the latter, who had been taken prisoner at Poitiers, recovered his liberty on a ransom of 3,000,000 crowns, while Edward renounced his claim to the crown of France, and relinquished Anjou and Maine, and the greater part of Normandy, in return for Aquitaine, Gascony, Poitou, Saintonge, Périgord, Limousin, etc.

BRETON, JULES ADOLphe (brā-tōn'), a French painter, born in Courrières, in 1827; was educated at St. Omer and at Douai, and trained as a painter under Félix Devigne at Ghent, and in Drölling's *atelier* at Paris. The subjects of his earlier pictures, such as "Misère de Désespoir" (1849), are taken from the French revolutionary period; but he soon turned to the scenes from peasant life which he has treated in a most poetic and suggestive manner, with an admirable union of style with realism. In 1853 he exhibited "Le Retour des Moissonneurs," and in 1855 his celebrated "Les Glaneuses." He is represented in the Luxembourg by "La Bénédiction des Blés" (1857), "Le Rappel des Glaneuses" (1859), and "Le Soir" (1861). An author of note, Breton wrote poetry and prose with equal facility. He died July 5, 1906.

BRETTEN, a town of Baden, Germany, the birthplace of Melanchthon, 16 miles E. N. E. of Karlsruhe by rail. The house in which the Reformer was born belongs now to a foundation bearing his name for the support of poor students, established in 1861. A monument was erected in 1867.

BRETT'S AND SCOTS, THE LAWS OF THE (Latin, *Leges inter Brettos et Scotos*), the name given in the 13th century to a code of laws in use among the Celtic tribes in Scotland.

BRETWALDA, a title assigned by the Saxon chronicle to those kings of the Heptarchy who extended their government over the entire nation. The following are mentioned by Bede, but Halam and other historians doubt whether any sovereign in those early times possessed such authority: A. D. 492, Ella King of Sussex; 571, Ceawlin, King of Wessex; 594, Ethelbert, King of Kent; 615, Redwald, King of West Angles; 623, Edwin, King of Deira; 634, Oswald, King of Bernicia; 643, Oswy, King of Bernicia.

BREVE, in music, a note or character of time, equal to two semibreves or four minims. It was formerly square in shape, but is now oval. It is the longest note in music.

BREVET, an honorary rank in the army. If the individual receiving it is a member of the regular army of the United States, the commission must emanate from Congress and pass through the hands of the President and Secretary of War; if he be a member of the national guard of one of the States, he receives his commission from the Governor of the State by virtue of authority vested in that functionary by the laws and Constitution of the State. The form of the brevet shows a nominal advancement from a lower to a higher grade; as a Brigadier-General, who becomes a Brevet Major-General, or Major-General by brevet. The brevet is granted for a special service in advance of the officer's regular promotion to the next higher grade, and the officer receiving it is entitled to have it recognized as a part of his title, as "John Jones, Colonel, and Brevet Brigadier-General."

BREVIARY, the book which contains prayers or offices to be used at the seven canonical hours of matins, prime, terce, sext, none, vespers, and compline by all in the orders of the Church of Rome, or in the enjoyment of any Roman Catholic benefice. It is not known at what time the use of the breviary was first enjoined, but the early offices were exhaustive from their great length, and under Gregory VII. (1073-1805) their abridgment was considered necessary, hence the origin of the breviary (Latin *brevis*, short). In 1568, Pius V. published that which has remained, with few modifications, to the present day. The Roman breviary, however, was never fully accepted by the Gallican Church until after the strenuous efforts made by the Ultramontanes from 1840 to 1864. The Psalms occupy a large place in the breviary: passages from the Old and New Testament and from the fathers

have the next place. All the services are in Latin, and their arrangement is very complex. The English Book of Common Prayer is based on the Roman Breviary.

BREVIPENNES, the name given by Cuvier to a family of birds, which he classes under *grallæ*, from the typical families of which, however, they differ in having wings so short as to prevent them flying. Example, the ostrich and its allies.

BREWER, a city of Maine, in Penobscot co. It is opposite Bangor, with which it is connected by a bridge. The city is on the Maine Central railroad. It has important industries, which include lumber, paper and pulp mills, brick yards, and shipbuilding yards. Pop. (1910) 5,667; (1920) 6,064.

BREWER, DAVID JOSIAH, an American jurist, born in Smyrna, Asia Minor, June 20, 1837; graduated at Yale College, 1856. He studied law in the office of his uncle, David Dudley Field, and was admitted to the bar in New York City in 1858. Removing to Kansas, he became prominent in his profession. He was judge of the Supreme Court of Kansas, 1870-1881, and was appointed United States Judge for the 8th Circuit in 1884. He rendered a memorable decision on the Kansas Prohibition Law, affirming the right of liquor manufacturers to compensation, for which he was severely criticized by the Prohibitionists. President Harrison elevated him to the Supreme Court of the United States in 1889. He was appointed to the Venezuela Commission by President Cleveland in 1906, and served as chairman. He died March 28, 1910.

BREWING, the process of extracting a saccharine solution from malted grain and converting the solution into fermented and sound alcoholic beverage called ale or beer.

The manufacture of ale or beer is of very high antiquity. The Chinese, Japanese, ancient Egyptians and Assyrians all drank beer. All the most ancient people made intoxicating drinks out of cereals. It is said that King Osiris, 1960 b. c., made beer out of malted corn. In ancient Spain there was also a form of beer drank by the prehistoric peoples which were genealogically connected with the Libyans of Africa. This Spanish drink, which was also known to the Gauls, was, according to Pliny, called *caelia* or *cerea*. The Phrygians and Thracians brewed beer and used it for a beverage. Archilochus, 700 b. c., tells about their *bryton*, which was made out

of barley and herbs. The ancient Armenians had a strong, intoxicating barley drink, which was imbibed by means of straws. Beer, called *sabja* or *sab-jum*, was known among the Thracians, the Illyrians, and Pannonians. Priscus, 448 A. D., traveled through Bavaria and mentions a barley drink which the Bavarians called *camum*. In the first century A. D., in central France, beer was known to the people under the name of *korma*. When the Germans turned from fighting to the cultivation of the soil they began to manufacture beer and ale. Cæsar does not mention this, but Diodorus and Tacitus, who lived later than Cæsar, mentioned it.

The various beers manufactured from grain have sometimes been classified under the three heads, beer, ale, and porter. The word beer in old German is spelled *peor*, *pior*, or *pier*, and is supposed to be connected with the word *biber*, which means "to drink." Another old German expression for drink was *alu*, *alo*, or *ealo*, preserved in the English word ale. The beer of the ancients was essentially different from modern beer, because hops were not used in its manufacture, they having been introduced from the Orient. The first mention of a hop garden is in a law of Pepin in 768. Apparently the monasteries were the first in the Middle Ages to brew a good beer; St. Hildegard, Abbess of Rupertsberg, in 1079, mentions hops as used in the manufacture of beer, and there were many hop gardens in Bavaria, France, and lower Saxony. The industry gradually spread from the monasteries into the hands of the common people.

The special patron of the modern brewing of beer was considered to be the fabulous King Gambrinus, who, about the year 1200, is said to have discovered the method and to have sanctified the land of Brabant with his discovery. Gambrinus is supposed to have been the Duke John I. (Jan Primus), the son of Henry III.

Lager beer was brewed in Germany as early as the 13th century. The reputation of the Frankish and Bavarian beer dates from the 15th century. The first pale beer was produced at Nuremberg in 1541. Wheat beer is an English invention, and in the 15th century much of it was exported to Hamburg, and as early as 1520 it was brewed in that city. It soon spread over the whole of northern Germany. In 1572 it was brewed in Berlin and developed into the modern weiss beer. Porter was discovered by the brewer Harwood, and by the end of the 18th century was exported to all parts of the world.

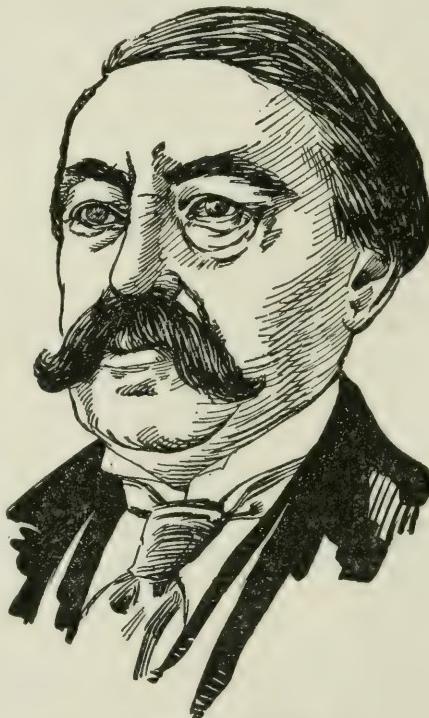
BREWSTER, SIR DAVID, a Scotch natural philosopher, born in Jedburgh in 1781. He was educated for the Church of Scotland. In 1808 he undertook the editorship of the "Edinburgh Encyclopædia," which was not finished till 1829. In 1815 he received the Copley medal for his paper on the "Polarization of Light by Reflection," and in the following year, for his discoveries in physics an award from the French Institute. In 1816 he invented the kaleidoscope, in 1818 received the Rumford medal of the Royal Society, and in 1830 was presented with the medal of the Royal Society for his further researches on the properties of light. In the same year, with Davy, Herschel, and Babbage, he originated the British Association, the first meeting of which was held at York in 1831. He was knighted by William IV. In 1841 he became principal of St. Leonard's College at St. Andrew's. In 1849 he was elected President of the British Association, and the same year was chosen, in the place of Berzelius, one of the eight foreign Associates of the French Academy of Sciences. His discoveries in reference to the properties of light have led to great improvements in the illumination of lighthouses. Among his more popular works are a "Treatise on the Kaleidoscope," a "Treatise on the Stereoscope," a "Treatise on Optics," "Letters on Natural Magic," "The Martyrs of Science," and "Memoirs on the Life and Writings of Sir Isaac Newton." He died in Montrose, Scotland, Feb. 2, 1868.

BREWSTER, WILLIAM, one of the Massachusetts Pilgrims, was born in Scrooby, England, in 1560. He came of a well known family; was educated at the University of Cambridge, and was for a time postmaster at Scrooby. He had accepted the Separatist doctrines taught by Hooker and others, and in consequence had to flee to Holland, where he supported himself by printing. He was one of the leaders of those who sailed for the New World in the "Mayflower," and, as elder of the church, encouraged his fellow colonists at Plymouth both by his preaching and his example. He died in Plymouth, Mass., April 10, 1644.

BRIAN (surnamed BOROMHE), King of Ireland, son of Kennedy, King of Munster, son of Lorcan. He ascended the throne of both Munsters, *i. e.*, the present counties of Tipperary and Clare, A. D. 978. His earlier exploits were against the Danes of Limerick and Waterford, but, being elated by frequent successes against these invaders,

he deposed O'Maelachaglin, the supreme king of the island, and eventually became himself monarch of Ireland. Having disputed with Maelmora, the King of Leinster, Maelmora revolted, and, inviting a new invasion of Danes to his assistance, brought on the battle of Clontarf, in which King Brian fell, after gaining a glorious victory on Good Friday, 1014. He was the founder of the numerous sept of O'Brien, O or Ua being a distinctive adnomen not assumed by Irish families till after his time. This national prefix means "descendant of," or, "of the kindred of," and was originally supplied by the more ancient Mac, which means "son."

BRIAND, ARISTIDE, a French statesman, born in Nantes in 1863. He intended to embrace the law as a profession, but his tendencies led him rather toward journalism and politics. He was connected with a number of Rad-



ARISTIDE BRIAND

ical journals and allied himself with the Socialist party, in which he soon became a prominent figure. He possessed remarkable oratorical gifts, his voice especially being penetrating and musical. He was elected to the Chamber of Deputies in 1902, and in 1906 became Min-

ister of Public Instruction. He was anti-clerical in his sentiments, but he handled the delicate question of the relation of Church and State with tact and moderation. He was three times Prime Minister; in 1909, 1913, and 1916. In case of national exigency, he did not hesitate to act with great decision, as in the great French railway strike, which he broke by calling the employees to the colors. During the war he was a powerful and determined supporter of the Allied cause.

BRIAR. See ROSE.

BRIARE (brē-är), a town of France, in the department of Loiret, on the Loire, 25 miles S. of Montargis. The canal, to which the town is indebted for its importance, is the oldest work of the kind in France, having been begun in the reign of Henry IV., though it was not finished till 1740. It establishes, by means of its junction with the canal of Loing at Montargis, a communication between the Loire and the Seine, and conveys the various products of the province, watered by the former, to Paris.

BRIAREUS, a famous giant, son of Coelus and Terra, who had 100 hands and 50 heads, and was called by men Aegeon, and only by the gods Briareus. He assisted the giants in their war against the gods, and, according to the accounts of some, was thrown under Mt. Atna.

BRIBERY, in the United States, the word applied to an attempt to corruptly influence, by means of offers of reward, the course of legislation, the result of an election, the verdict of a jury, the decision of a magistrate, etc. It is not necessary to constitute an indictable offence that the bribe be accepted. The tender of the bribe is the essence of the crime. If a bribe be offered a witness to swear falsely the crime is not bribery, but is merged into subornation or perjury. The penalty for bribery is fine or imprisonment, or both.

BRICE, ST., Bishop of Tours in the beginning of the 5th century, is commemorated as a confessor. St. Brice's Day, in 1002 (in the reign of Ethelred II.), is notorious in old English history for a great massacre of the Danes. It was believed that it was a concerted attempt to exterminate all the Danes in England; but, failing of its bloody purpose, it led to reprisals by the Danish King Sweyn.

BRICK, a kind of artificial stone, made of clay, molded, dried in the sun

and baked in a kiln. The word is also applied to the block in its previous condition as a molded plastic mass, and as a dried block in which the water hygroscopically combined with the clay is driven off. When this condition is accepted as a finality, the block so dried is an adobe. The burning of the previously dried brick drives off the chemically combined water, and forever changes the character of the mass. An adobe may become resaturated with water, and resume its plasticity; a brick may become rotten and disintegrated, but not plastic. There are two principal kinds of brick, building brick and fire brick, and their composition depends upon the use to which they are put; a good building brick will contain about 50 per cent. silica, 25 per cent. alumina and oxide of iron, 3 per cent. carbonate of lime, 1 per cent. carbonate of magnesium, and 21 per cent. of water and other constituents; while a fire brick will contain about 59 per cent. silica, 35 per cent. alumnia, 3 per cent. of oxide of iron, and only 3 per cent. of carbonate of lime, carbonate of Magnesia, and water, combined. Fire brick is used to line furnaces, crucibles, and in other places where a high heat is maintained; and must contain as little fusible matter as possible. Some of the best clays in the world for brick making are found in New Jersey, at Perth Amboy, Woodbridge, and Trenton, and one of the largest brick making establishments in the world is situated at Haverstraw, N. Y.

Building bricks come under various names according to the use to which they are put, or the position they occupy in a building. Some of these are: Air brick is an iron grating the size of a brick, or a perforated brick, let into a wall to allow the passage of air. Arch brick usually means the hard burned, partially vitrified brick from the arches of the brick clamp in which the fire is made and maintained. A brick made voussoir shape¹ is known as a compass brick. A capping brick is one for the upper course of a wall; clinker, a brick from an arch of the clamp, so named from the sharp, glassy sound when struck; a coping brick, one for a coping course on a wall; feather edged brick, of prismatic form, for arches, vaults, niches, etc.; fire brick, made of intractable material, so as to resist fusion in furnaces and kilns; hollow brick, with openings for ventilation; stocks, a name given to the best class of bricks, and also locally to peculiar varieties, as gray stocks, red stocks, etc.; pressed brick another name for

that class of stock brick, in which the process of manufacture has been to largely reduce the bulk of the plastic material by hydraulic pressure before burning, giving to the completed brick a smooth surface and great density of body. Pecking, place, sandal, semel brick, are local terms applied to imperfectly burned or refuse brick. Bricks vitrified by excessive heat are termed burr bricks or burrs.

Bricks were manufactured at a remote period of antiquity by the Egyptians, the Babylonians, the Assyrians, and some of them, being inscribed with written characters, have been of priceless value in conveying historic facts to the present age. About A. D. 44, bricks were made in England by the Romans, and in A. D. 886 by the Anglo-Saxons under King Alfred. Under Henry VIII. and Queen Elizabeth the manufacture greatly flourished. The size was regulated by Charles I. in 1625.

The following table gives the value of the brick output in the United States in 1918:

Common brick	\$37,208,000
Enameled brick	685,000
Vitrified paving brick	7,232,000
Ornamental brick	35,000
Front brick	6,339,000
Fire brick	63,637,000

BRIDE, ST. See BRIDGET.

BRIDEWELL, in England a house of correction for offenders. The name is derived from the ancient London house of correction, originally a hospital founded by Edward VI. on the site of St. Bride's Well, in Blackfriars, a well known object of pilgrimage in Roman Catholic times.

BRIDGE, a structure consisting of an arch or series of arches supporting a roadway above it, designed to unite two banks of a river or the two sides of an open space. A bridge is generally made of wood, iron, stone, steel, or of brick. The extreme supports of the arches at the two ends are called butments, or abutments; the solid parts between the arches, piers, and the fences on the sides of the road or pathway, parapets. Bridges are now of many kinds, the most usual varieties being the following:

Suspension Bridges.—These bridges are such in which the roadway is suspended from chains, links, cables or ropes, passing over piers or towers, fixed or anchored at their extremities. Another line of evolution had its origin in the principle of suspension. In the typical modern suspension bridge, when the weight of the roadway is known by the stress on the suspending links, the

problem of statical equilibrium assumes the simplest form, and the conditions of strength and stability are steadily determined. But when there is a shifting or rolling load on the roadway, which is heavy in proportion to the weight of the bridge, as, for example, a railway train, the conditions are involved. When the train occupies, say, only one-half of the bridge, the chain is depressed on one side, and is raised on the other side. Thus an undulation is produced in the bridge, which, especially if the train be moving rapidly, may seriously disturb the equilibrium, and even endanger the stability of the bridge. Various combinations have been devised to overcome this difficulty. The simplest and probably the best course is to stiffen the roadway, so that the stress of the passing load may be distributed over a considerable length of chain. In this manner large railway bridges have been constructed, for example, the Roebling bridge (1855) over the Niagara, $2\frac{1}{3}$ miles below the falls, having a span of 822 feet, and being 245 feet above the level of the stream.

The Brooklyn suspension bridge, across the East River, between New York and Brooklyn, opened in 1883, is built of steel. It has a central span of 1,595½ feet, and two land spans of 930 feet each; making, with approaches, a total length of 5,989 feet, or about one mile and one furlong. The anchorage at each end is a solid cubical structure of stone, measuring 119 feet one way, by 132 feet the other, rising to a height of 90 feet above high water mark, weighing 60,000 tons each. The towers are 278 feet high. The weight of the whole structure suspended between the towers is nearly 7,000 tons. The stress of suspension is borne by four cables of 5,296 steel wires each, 15¼ inches in diameter. The foundations of the towers were laid by means of caissons and compressed air, at a level of about 80 feet below high water mark. The Manhattan Bridge (constructed 1901-1911) across the East River between New York and Brooklyn, has a river span of 1,470 feet and a shore span of 725. It is 132 feet wide. The Queensboro bridge (1901 - 1909) over the East River, joining New York and Long Island City, is 7,144 feet long and 90 feet wide.

Cantilever Bridges.—A cantilever is a bracket. It is a structure overhanging from a fixed base. The bridge across the river Forth on the North British railway system is one of the largest and most magnificent bridges in the world. The site of the bridge is at

Queensferry. At this place, the estuary of the Forth is divided by the island of Inchgarvie into two channels, whose depth, as much as 200 feet, precluded the construction of intermediate piers. Hence, two large spans of 1,700 feet each were adopted. Between these, the central pier is founded on the island midway across, and is known as Inchgarvie pier. There are two other main piers, shore piers, known respectively as the Fife pier and the Queensferry pier. Of these three piers respectively three double lattice work cantilevers like scalebeams, 1,360 feet, or a quarter of a mile in length, are poised in line, reaching toward each other, and connected at their extremities by ordinary girders 350 feet long, by which the two main spans are completed. The bridge consists of two main spans of 1,700 feet, or nearly one-third of a mile each; two of 675 feet each, being the shore ends of the outer cantilevers; and 15 spans of

spans with fixed continuous spans connecting them. The Queensboro bridge is of the cantilever type. The Quebec bridge, 640 feet long, which fell while in course of construction in 1907, and again in 1917, was completed in the latter year. The Spokane bridge over the Willamette river has a draw span of 521 feet, the largest in the world (1920). The Quebec cantilever-truss bridge (1916) has a span of 1,800 feet. Other notable cantilever bridges are those across the Colorado river, at Red Rock, Cal., and across the Mississippi river, at Memphis, Tenn.

Arch Bridges.—Bridges in the shape of arches are often built in places where a more artistic structure than a truss is desired. The High bridge and Washington bridge across the Harlem river in New York City are examples of this style of bridge. The High bridge was built to carry the Croton aqueduct across the Harlem river. It consists of 13



CANTILEVER BRIDGE

168 feet each. The total length of the viaduct, including piers, is 8,296 feet, or a little over $1\frac{1}{2}$ miles, of which almost exactly one mile is covered by the great cantilevers. The clear headway under the center of the bridge is 152 feet at highwater, and the highest part of the bridge is 361 feet above the same level. Between the two main girders a double line of railway is carried on an internal viaduct supported by trestles and cross girders. The whole of the metal work of the superstructure is of Siemens steel. The way consists of heavy bridge rails laid on longitudinal sleepers bedded in four steel troughs, into which the wheels will drop in case of derailment, when they will run on the sleepers.

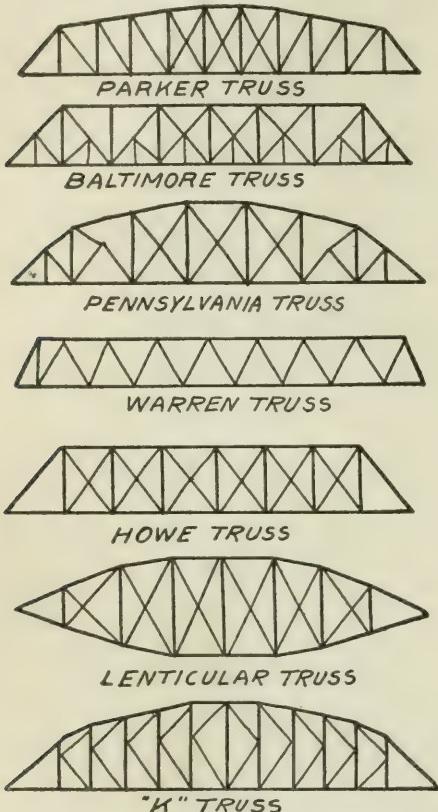
In the piers there are about 120,000 cubic yards of masonry, and in the superstructure 44,500 tons of steel.

There are several of these bridges in the United States, the first of any size being the Niagara cantilever, built in 1883. Its total length is 910 feet, and it is 295 feet above the surface of the river, with steel towers 130 feet high. The Hudson river bridge at Poughkeepsie, built in 1889, has a length of 6,767 feet and is built in five spans; the first, third and fifth being true cantilever

granite arches, the highest one being 116 feet above the river. The bridge, crossing the river and valley, is 1,460 feet long. The Washington bridge is situated a short distance N. of the High bridge and consists of nine arches, three of granite on the E. side, four of granite on the W., and two central steel spans connecting them. The entire length of the bridge is 2,300 feet, and width, 80 feet; the central spans being each 510 feet long and 135 feet above high water. Another noted arch bridge is located at St. Louis, Mo. It has two spans of 497 feet and one of 515, with a total length, including abutments of 1,700 feet. It is a two story affair with a double railroad track below and a roadway above. The Hell Gate bridge over the East River in New York City is 1,000 feet in length, and is the largest arch bridge yet constructed. It was completed in 1916.

American Quadrangular Girder Bridges.—One of the best examples of American long-span iron-bridge construction is the bridge across the Kentucky river on the Cincinnati Southern railroad, noteworthy for its economical design and comparatively light weight. The iron work of the bridge is 1,138 feet

in length, and it consists of three spans of 375 feet each. It crosses a limestone canon at a height of 280 feet above the bed of the stream. The piers are of stone to a height of 60 feet, to clear the highest recorded floods; and they are about 34 feet thick at the flood level. Above the stonework the piers are of iron. The truss or girder is rectangular in section, 37½ feet high, 18 feet wide, consisting of top and bottom pairs of



TYPES OF BRIDGE TRUSSES

booms, forming the corners, united by panels or frames at intervals of 18½ feet longitudinally, stiffened and bound with diagonal tie rods. The booms each consist of flat plates placed vertically, riveted together. The piers consist of hollow pillars of plate iron riveted together in box form. The diagonal rods are pin connected, that is to say, they are connected to the framework with cylindrical pins, a form of connection much practiced in the United States. The bridge was completed in February, 1877.

Lattice Girder Bridges.—The iron

lattice bridge, so called from having sides constructed with cross bars, like lattice work, is the natural outcome of the tubular bridge for long spans, developing equal strength with considerable economy of material and labor. Lattice girders are now almost universally adopted for iron bridges for long spans.

Movable Bridges.—Movable bridges are usually required in the neighborhood of rivers, docks, wharves, canals, and like situations for the passage of ships and boats. They are variously designed and adapted to particular situations, and may be classified as (1) bascules or drawbridges, (2) swing bridges, (3) traversing bridges, (4) lift bridges, (5) pontoon bridges.

Bascules or Drawbridges.—The bascule bridge is such as is raised by turning, in one piece or in two pieces, round one or two horizontal axes or hinges. For large dimensions it is convenient to construct the bridge in two halves, lifting from each side, and abutting together to the middle. A bridge of this sort has been built across the Thames at London and another for elevated railroad use across the Chicago canal. They are now comparatively common. The largest one of the type was completed over the Chicago river in 1919.

Swing Bridges.—Swing bridges are by far the most commonly employed of movable bridges. The large rivers to be crossed in the United States have demanded swing bridges of great span, with excellent contrivances for minimizing friction and insuring steadiness when closed. The swing bridge over the Raritan, in New Jersey, allows two free passages, each 216 feet wide. The Kansas City bridge crosses two passages, each 160 feet wide. The total moving weight is 303 tons. The bridge is opened by steam power in about one and a half minutes, or by manual power in two minutes.

Traversing Bridges.—Movable bridges, sometimes called telescope bridges, capable of being rolled horizontally backward, or in an oblique direction, are occasionally employed. The bridge across the Arun, near Arundel, on the South Coast railway, is 144 feet long. It is traversed on wheels, and acts as a sliding cantilever, the overhanging portion resting on the opposite abutment when in place.

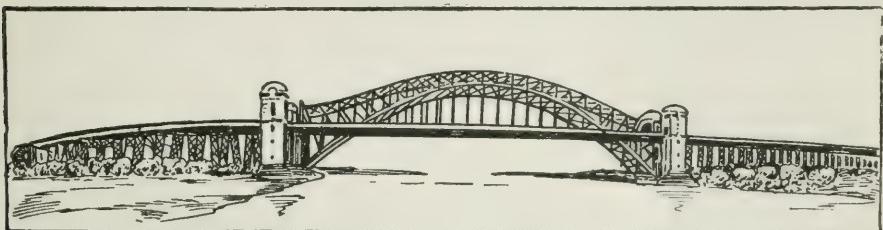
Lift Bridges.—A notable example is the one erected over the Surrey canal, which is lifted by the four corners; another over the Royal canal, Dublin.

Pontoon Bridges.—Bridges of boats are made of boats laid over with planks, fastened across the stream by means of anchors or stakes. The bridge at Rouen

is 300 yards long, paved with stone for the passage of carriages and horses. The so-called flying bridge is rather a ferry than a bridge of boats.

The longest floating bridge in the world, probably, is the pontoon bridge across the river Hooghly, at Calcutta,

ends. They are each of the great length of 160 feet, made of such considerable length in order to obviate pitching motion in rough weather. The roadway platform is of 3-inch planks of teakwood from Burma, forming a roadway 48 feet wide, with a footpath at each side 7 feet



HELL GATE BRIDGE OVER EAST RIVER, NEW YORK

designed and constructed by Sir Bradford Leslie. The bridge is 1,530 feet long between the abutments, and is carried on 14 pairs of pontoons, which are held in position by means of chain cables, 1½ inches thick, and anchors weighing three tons each, laid on the up stream and down stream sides, 900 feet asunder. By

wide. An opening 200 feet wide, for the passage of ships, is made by removing, when occasion requires, four of the pontoons with their superstructure, and sheering them clear of the opening. The floating bridge is connected with the shore at each end by adjusting ways hinged to the shore.



ROLLING LIFT BRIDGE

their great length, the cables afford the necessary spring to allow for the ordinary rise and fall of the river, the stress on each cable varying from 5 tons to 25 tons, according to the stage of the weather and of the tide, the maximum velocity of which is 6 miles an hour. The pontoons are rectangular iron boxes, having rounded bilges and wedge-shaped

Military Bridges are temporary constructions to facilitate the passage of rivers by troops, to restore a broken arch, or cross a chasm of no very great width. Those over a river are either floating or fixed. The former are made of pontoons, boats, casks, rafts of timber, or anything that will give sufficient buoyancy; and the latter of piles, trestles, or other timber

work. Spars, ropes, and planks are used in a variety of ways for spanning narrow chasms. The pontoon bridge is the only one which is carried with an army. Heavy guns are better warped across on specially constructed rafts. A flying bridge is a boat or raft anchored by a long cable up stream, and carried across by the action of the current acting obliquely against its side, which should be kept at about an angle of 55° with the current.

Of the rock formations called natural bridges, the most remarkable is the

countries of imperfect civilization even yet they are few.

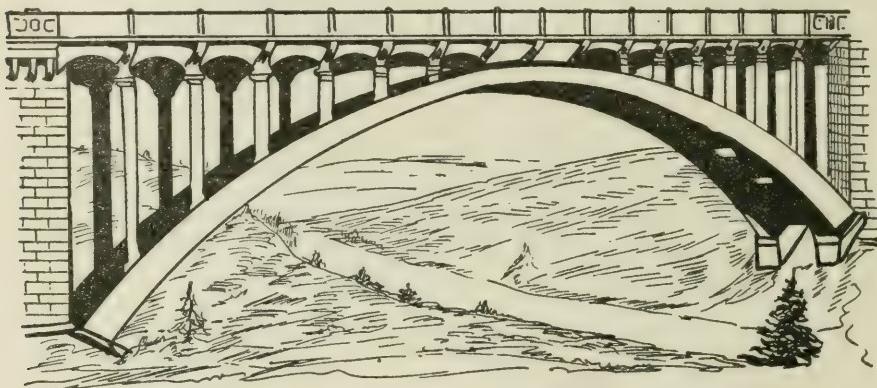
Following is a list of the notable bridges of the world:

Pons Sublicus, across the Tiber at Rome, defended 507 B. C., by Horatius Cocles.

Cæsar's bridge across the Rhine, a wooden trestle-work, built 55 B. C.

Trajan's magnificent bridge over the Danube, 4,770 feet in length, built A. D. 115.

London bridge. One existed at the end of the 10th century; one built of wood,



LARIMER BRIDGE, PITTSBURGH, PA.—A CONCRETE ARCH

natural bridge over Cedar Creek, in Virginia, 125 miles W. of Richmond. The mass of siliceous limestone through which the little river passes is presumably all that remains of a once extensive stratum. The cavern or arch is 200 feet high and 60 feet wide. The solid rock walls are nearly perpendicular, and the crown of the arch is 40 feet thick.

History of Bridges.—Bridges seem to have existed in China from a period of considerable antiquity. The word bridge does not occur in the Authorized Version of the Bible. Temporary bridges, for military purposes, were constructed before permanent structures for the convenience of the inhabitants were erected. The former were often of boats. Thus, Cyrus constructed such bridges about 536 B. C., Darius Hystaspes about 490, and Xerxes about 480 B. C. Bridges of stone or brick seem to have been first used by the Romans; there were none erected in Greece till after the Roman conquest. The first Roman bridge is said to have been one spanning the Tiber, between the Janiculum and the Aventine mountain, built by or under Ancus Martius. Now they are universal in properly civilized countries, though in

1014; a stone bridge, by Peter of Colechurch, begun 1176, was finished 1209. The new London bridge is constructed of granite, from the designs of L. Rennie; it was commenced in 1824 and completed in about seven years, at a cost of \$7,290,000.

The bridge at Burton, over the Trent, was formerly the longest bridge in England, being 1,545 feet. It is now partly removed. Built in the 12th century.

The Bridge of the Holy Trinity, at Florence, Italy, was built in 1569. It is 322 feet long, constructed of white marble, and stands unrivaled as a work of art.

The Rialto, at Venice, is said to have been built from the designs of Michael Angelo. It is a single marble arch, $98\frac{1}{2}$ feet long, and was completed in 1591.

The Bridge of Sighs, at Venice, over which condemned prisoners were transported from the Hall of Judgment to the place of execution, was built in 1589.

Brooklyn Bridge was commenced, under the direction of John A. Roebling, in 1870, and completed in about 13 years.

Coalbrookdale bridge, England, was the first cast-iron bridge. It was built over the Severn in 1779.

High bridge, New York, by which the Croton aqueduct is carried across Harlem river, is of granite throughout.

Victoria bridge, which spans the St. Lawrence at Montreal, Canada. It is tubular and 9,194 feet, or nearly 2 miles, long. The massive tube through which the railway track is laid is 22 feet high and 16 feet wide. It was formally opened in 1860.

as war memorials. A notable one is the State Soldiers' and Sailors' memorial bridge at Harrisburg, Pa., built at a cost of over \$2,000,000, and completed in 1919.

Besides the bridges here enumerated, there are many other notable specimens of bridge architecture in this country.

BRIDGE, SIR FREDERICK, an English organist and composer, born in Old-



BRIDGE OF SIGHES, VENICE

The St. Louis bridge, across the Mississippi river, from St. Louis, Mo., to East St. Louis, Ill., is regarded as one of the greatest triumphs of American engineering. It was designed by James B. Eads; was begun in 1869, and was completed in 1874.

Several bridges have been constructed

bury, Worcestershire, Dec. 5, 1844; was organist of Trinity Church, Windsor, Manchester Cathedral, and, since 1875, full organist of Westminster Abbey. He wrote the oratorio, "Mount Moriah," the cantata, "Boadicea," the cantata, "Calirhoe," the oratorio, "The Repentance of Nineveh," etc. He has set many hymns

to music, notably Gladstone's Latin version of "Rock of Ages."

BRIDGE OF SIGHTS. a bridge in Venice, spanning the Rio della Paglia and connecting the ducal palace with the prisons. It dates back to 1597 and forms a graceful arch 32 feet above the water, inclosed at the sides and arched overhead. It contains two passages, through which prisoners were led for trial, judgment or punishment.

BRIDGEPORT, a consolidated town and city, and one of the county-seats of Fairfield co., Conn.; on Long Island Sound, at the mouth of the Pequonnock river, and on the New York, New Haven and Hartford railroad; 18 miles S. W. of New Haven. The city is built on a plain on each side of the river, the E. portion being named East Bridgeport, and the W., lying back of the plain, rising to an elevation of about 70 feet above high water, is known as Golden Hill, and contains many elegant residences. There are public parks, the most attractive of which is Seaside Park on the shore, having a sea-wall and a picturesque drive, and containing a Soldiers' Monument and a statue of Elias Howe. The portion of the city known as Black Rock is a much frequented resort during the summer months. Bridgeport contains many churches and chapels, a well endowed public library, and many other public buildings. Among these are a United States Government building, containing the postoffice and custom-house departments; the County Court House; a Y. M. C. A. building; the Barnum Memorial Institute, bequeathed jointly to the Historical and Scientific Societies; several hospitals, and an orphan asylum and widows' home. The city is noted for its large manufacturing interests, and is the seat of the Singer sewing machine, the Union Metallic Cartridge works, the Remington Arms Co., and many other establishments of the first class. During the World War Bridgeport was one of the chief manufacturing centers of the country. The principal manufactures besides those mentioned are carriages, furniture, bicycles, typewriters, hardware, monumental bronze, cutlery, wire, silk, corsets, brass goods and other commodities. In 1919 there were 3 National banks. Bridgeport was settled in 1670, under the name of Fairfield village, and was incorporated as a city in 1836. Pop. (1910) 102,054; (1920) 143,555.

BRIDGES, ROBERT, English poet-laureate; born Oct. 23, 1844. He was

educated at Eton and Oxford and became a physician, retiring from the active practice of his profession in 1882. He wrote many poems of considerable poetic merit, though he cannot be classed among the masters of English verse. He was made poet-laureate, succeeding Alfred Austin in that post in 1913. Among his best poems are "Eros and Psyche" and "Achilles in Scyros." A complete edition of his works was published in 1913.

BRIDGET, the name of two saints in the Roman Catholic Church. The first, better known as St. Bride, was born in Ireland about the end of the 5th century. She was exceedingly beautiful, and to avoid offers of marriage and other temptations, implored God to render her ugly, which prayer was granted. An order of nuns of St. Bride was established, which continued to flourish for centuries. St. Bride was held in great reverence in Scotland. The second St. Bridget, or more properly Birgit or Brigitte, was the daughter of a Swedish prince, born about 1302, and died at Rome in 1373, on her return from a pilgrimage to Palestine. She left a series of mystic writings which were pronounced inspired by Gregory XI. and Urban VI. Her youngest daughter, Catherine, was also canonized, and became the patron saint of Sweden.

BRIDGETON, city, port of entry and county-seat of Cumberland co., N. J.; on the Cohansay river and several railroads; 38 miles S. of Philadelphia. It is a very old settlement, having been a place of considerable importance before the Revolutionary War. Its surroundings are agricultural; and it has manufactures of glass, gas pipe, nails, machinery, flour, oil cloth, woolen goods, shoes, and shirts, and also large fruit and vegetable canning interests. It has a public park, Tumbling Dam, which contains a picturesque lake and a fine athletic field. The city contains the Ivy Hall Seminary, a public high school, National banks, good water and sewage systems, and electric lights and street railroads. Its excellent climate and scenic attractions have made the city a popular resort for summer tourists and residents. Pop. (1910) 14,209; (1920) 14,323.

BRIDGETOWN, the capital of the island of Barbadoes, in the West Indies, extending along the shore of Carlisle Bay, on the S. W. coast of the island for nearly 2 miles. Its appearance is very pleasing, the houses being embosomed in trees, while hills of moderate height rise behind, studded with

villas. Bridgetown is the residence of the governor-general of the Windward Islands. Pop. about 17,000.

BRIDGEWATER, a town in Plymouth co., Mass.; on the New York, New Haven and Hartford railroad; 27 miles S. of Boston. It contains five villages and has a State Normal School, the State Farm, State Almshouse, a public library, a savings bank, and manufactories of iron, nails, tacks, boots, shoes, and brick. Pop. (1910) 7,688; (1920) 8,438.

BRIDGEWATER, FRANCIS EGERTON, third DUKE OF, the "Father of Inland Navigation in Great Britain," born in 1736. With the assistance of his celebrated engineer, Brindley, and after enormous expense, and years of difficulty, he cut a canal uniting Liverpool and Manchester which was completed in 1761. He afterward promoted the Grand Trunk Canal navigation, and by the two schemes, for a while, so impoverished himself that he was deprived of the commonest comforts. He became ultimately the possessor of immense wealth, realized from the results of his life's labors. The annual value of the Bridgewater canal estate is estimated at about \$1,250,000. He died in London, March 3, 1803.

BRIDGMAN, FREDERIC ARTHUR, an American artist, born in Tuskegee, Ala., Nov. 10, 1847. He studied at the Brooklyn Art School and National Academy of Design, and was a pupil of J. L. Gérôme, and at the École des Beaux Arts. Elected to the American Academy of Design 1891, Chairman American Art Department, Paris Exposition 1900, Officer Legion of Honor 1907. Is noted for Oriental and archaeological figure pieces. Among his notable paintings are "Procession in Honor of Isis" and "The Bocher-Biskra."

BRIDGMAN, LAURA, an American blind mute, born in Hanover, N. H., Dec. 21, 1829. She was a bright, intelligent child, but at two years of age both sight and hearing were entirely destroyed by fever, but she learned to find her way about the house and neighborhood, and even learned to sew and to knit a little. In 1839 Dr. Howe, of Boston, undertook her care and education at the deaf and dumb school. The first attempt was to give her a knowledge of arbitrary signs, by which she could interchange thoughts with others. Then she learned to read embossed letters by touch; next, embossed words were attached to different articles, and she learned to associate each word with its corresponding

object. She learned to know people almost instantly by the touch alone. In a year or two more she was able to receive lessons in geography, algebra, and history. She received and answered letters from all parts of the world. She learned to write a fair, legible, square hand, and to read with great dexterity. She died May 4, 1889.

BRIDLE, a head stall, bit, and bearing or riding rein, completing the head gear of a horse's harness. The modern bridle of Europe and America consists of the following pieces: The crown piece, the brow band, the cheek strap, the throat latch or lash, the rein, and the bit. Sometimes, also, there are a nose band, blinkers or blinders, and a hitching strap.

BRIDLE BIT, a bit connected with a bridle. Such bits are seen in Assyrian and Egyptian paintings and sculptures, and are subsequently mentioned by Xenophon. Bridle bits may be classed under three heads: Snaffles, curb bits, and stiff bits. The snaffle has two bars, joined together in the middle of the mouth, and has rings at the end for the rein. It sometimes has cheek pieces to keep the ring from pulling into the mouth of the animal. The curb bit consists of the following parts: Cheek pieces or branches, with eyes for the cheek straps and for the reins, and holes for the curb chain; a mouthpiece, uniting the cheek pieces and forming the bit proper; sometimes a bar uniting the lower ends of the branches; a curb chain. The elastic bit consists of a chain covered by closely coiled wire between the bit rings. Another form of elastic bit is made of twisted wire with a soft rubber covering.

BRIDLINGTON CRAG, a deposit belonging to the Newer Pliocene. It consists of sand and bluish clay, with fragments of various rocks. It contains mollusks, of which four species are extinct, *natica occlusa*, *cardita analis*, *nucula cobboldiae*, and *tellina obliqua*; most of the remaining species are Arctic shells. It appears to have been deposited during the period of the greatest cold.

BRIEF, from the Latin *brevis*, short, a brief or short statement or summary, particularly the summary of a client's case which the solicitor draws up for the instruction of counsel. A brief may also mean, in law, an order emanating from the Superior Courts. A Papal brief is a sort of pastoral letter in which the Pope gives his decision on some matter which concerns the party to whom

it is addressed. The brief is an official document, but of a less public character than the bull.

BRIEL, or **BRIELLE**, sometimes **THE BRILL**, a fortified seaport town of South Holland, on the N. side of the island of Voorne, near the mouth of the Maas. It contains a government arsenal and military magazines, and possesses a good harbor. Pop. 4,000, chiefly engaged as pilots and fishermen. Briel may be considered as the nucleus of the Dutch republic, having been taken from the Spaniards by William de la Marck in 1572. This event was the first act of open hostility to Philip II., and paved the way to the complete liberation of the country. The celebrated admirals De Witt and Van Tromp were natives.

BRIENNE (brē-en') a town of France, in the department of Aube; 15 miles N. W. of Bar-sur-Aube. It is remarkable as formerly possessing a military college where the Emperor Napoleon I. received the first rudiments of his education. Here also he attacked Blücher, Jan. 29, 1814, forcing him from the town and compelling him to retreat to Trannes.

BRIEY, BASIN OF, a rich mineral district in Lorraine, close to the former frontier between France and Germany, on the railway that runs due west from Verdun to Metz. It is the greatest iron producing district in the world. In 1916 the mines of the Briey basin produced nearly 42,000,000 tons. At that time the district was in the hands of the German invaders. Had not the rush of the German armies in 1914 gained possession of the district, Germany would never have been able to prolong the war, for during the conflict it produced 80 per cent. of the steel for the German armament. Had Germany won, it was the announced purpose of her rulers to make the possession of the district one of the terms of peace.

The Basin of Briey runs from the Belgium-Luxemburg frontier up the left bank of the Moselle at an average distance of 10 miles from the river. It has an area of 225 square miles, its greatest length being 35 miles and its greatest breadth 21 miles. The boundary line between France and Germany cut the district nearly in two. At the outbreak of the war, Germany was mining about 21,000,000 tons annually from her part of the Basin and France 15,000,000. All through the conflict Germany was adding the French production to her own, and in addition was mining about 6,000,000 tons from that part of the dis-

trict that reached over into Luxemburg. It gave her an incalculable advantage in the struggle.

The Treaty of Peace with Germany put the Briey district under the control of France.

BRIG (contracted from brigantine), a vessel with two masts, square-rigged on both.

BRIGADE, a portion of an army, whether infantry, cavalry, or artillery, consisting of two or more regiments, under the command of a brigadier-general.

BRIGADE MAJOR, a staff officer attached to the brigade to assist the officer by whom it is commanded.

BRIGADIER, an abbreviation of brigadier-general. It is in common use in the armies of modern civilized nations, the forces being divided into brigades in charge of brigadiers.

BRIGADIER-GENERAL, a military officer of intermediate rank, between a major-general and a colonel. See BREVET.

BRIGANDINE, a piece of defensive armor worn in the Middle Ages, consisting of thin jointed scales of plate, generally sewed upon linen or leather, the whole forming a coat or tunic.

BRIGANDS, a name originally given to the mercenaries who held Paris during King John's imprisonment (1358), and who made themselves notorious for their ill behavior. It was applied by Froissart to a kind of irregular foot soldiery, and from them was transferred to simple robbers; it is now used especially of such of these as live in bands in secret mountain or forest retreats. In Cuba, in 1888, political discontent was made the excuse for the brigandage then rampant in the island, where four provinces were on this account declared in a state of siege. Religious persecution also has encouraged brigandage; in Bosnia, which has always produced the most perfect specimens of bandits, it was formerly very common, the unhappy Christians, who were reduced by the Turks to the condition of serfs, frequently taking to the mountains in despair, and then wreaking vengeance on their oppressors. Generally speaking, in countries with a notably scanty population, which is yet in many districts as notably overcrowded, brigandage will be found still in existence. Vigorous steps have been taken during the last 50 years to repress the practice, and in some coun-

tries with signal success. In Greece, organized companies of brigands, as distinguished from bands of highway robbers, fortuitously collected, have disappeared; and, in Italy, the chiefs with whom princes made treaties are found only in history. Nevertheless, brigandage is by no means obsolete. In Sicily it is still active at times (see MAFIA); and the bands that infest the Turkish frontier are notoriously dangerous to the wayfaring merchant and the defenseless tourist. In 1887 special attention was attracted by the boldness of brigands in the Pyrenees, Tuscany, Servia, Macedonia, Asia Minor, and Mexico.

BRIGANTES, the most powerful of the old British tribes, inhabiting the country between the Humber and the Roman wall.

BRIGANTINE, a sailing vessel with two masts, the foremast rigged like a brig's, the main mast rigged like a schooner's. Called also hermaphrodite brig.

BRIGGS, CHARLES AUGUSTUS, an American clergyman and religious writer, born in New York City, Jan. 15, 1841. In 1874 he was appointed Professor of Hebrew in Union Theological Seminary in New York City. He was tried for heresy in 1892, but was acquitted. In 1899 he formally severed his connection with the New York Presbytery and was ordained a clergyman of the Protestant Episcopal Church. Among his works are "American Presbyterianism" (1885); "The Messiah of the Apostles" (1886); "The Messiah of the Gospels," "The Higher Criticism of the Hexateuch," and "The Bible, the Church, and the Reason"; "Christian Unity" (1909); "Theological Symbolics" (posthumous, 1914). He died in 1913.

BRIGGS, FRANK OBADIAH, American Senator; born at Concord, N. H., Aug. 12, 1851. He was graduated from the U. S. Military Academy in 1872, becoming second lieutenant in the Second Regiment of infantry. In 1877 he resigned from the army and settled in Trenton, N. J., joining the John A. Roebling's Sons Co. In 1899 he was chosen mayor of Trenton, in 1901 became a member of the State Board of Education, and in 1902 State Treasurer. He was elected to the United States Senate in 1907, but was defeated in 1912. He died in the following year.

BRIGGS, HENRY, an English mathematician, born near Halifax, Yorkshire, in 1561; studied at St. John's College,

Cambridge. In 1592 he was appointed reader of the Physic Lecture founded by Dr. Linacre, and in 1596 first reader in geometry at Gresham House (afterward College), London, and in 1619 first Savilian Professor of Astronomy in Oxford. He made an important contribution to the theory of logarithms, of which he constructed invaluable tables, containing an improvement which was adopted by Napier the inventor. He published his "Logarithmorum Chilias Prima" in 1617, containing the first thousand natural numbers calculated to eight decimal places. He was also the author of a tract on the "Northwest Passage to the South Seas," by way of Virginia and Hudson Bay (1622), and in 1624 he published his "Arithmetica Logarithmica," the fruit of many years of unwearied application. His system of logarithms is that now commonly adopted. He next employed himself on a table of logarithms of sines and tangents, carried to the hundredth part of a degree, and to 15 places, which, with a table of natural sines, tangents, and secants, was printed at Gouda, in Holland, in 1631, and published in London in 1633, under the title of "Trigonometria Britannica." He died in Oxford, Jan. 26, 1631.

BRIGHAM, a city of Utah, in Box Elder co. It is on the Oregon Short Line and the Southern Pacific railroads. It is the center of an important fruit growing and agricultural region. There are cannery and cement factories, planning mills, and lumber yards. The city has a public library and other public buildings. Pop. (1910) 3,685; (1920) 5,282.

BRIGHT, JOHN, an English statesman, son of Jacob Bright, a Quaker cotton spinner and manufacturer at Rochdale, Lancashire, born in Lancashire, Nov. 16, 1811. When the Anti-Corn Law League was formed in 1839 he was one of its leading members, and, with Mr. Cobden, engaged in an extensive free-trade agitation. He was incessant, both at public meetings and in Parliament, in his opposition to the Corn Laws, until they were finally repealed. In 1845 he obtained the appointment of a select committee of the House on the Game Laws, and also one on the subject of cotton cultivation in India. A member of the Peace Society, he strenuously opposed the war with Russia in 1854. In 1855 he energetically denounced the Crimean War. Elected in 1857 for Birmingham, he seconded the motion against the second reading of the Conspiracy Bill, which led to the over-

throw of Lord Palmerston's government. Though he only once held office—as president of the Board of Trade in 1868 and Chancellor of the Duchy of Lancaster—he is credited with having exercised a greater influence upon the conduct of public affairs in England and abroad than, perhaps, any other man. He was the greatest English orator of modern times. He died in London, March 27, 1889.

BRIGHT, RICHARD, an English physician, born in Bristol, Sept. 28, 1789; studied at Edinburgh, Berlin, and Vienna. His name is associated with BRIGHT'S DISEASE (*q. v.*), he being the first who investigated its character. He died Dec. 16, 1858.

BRIGHTON (formerly BRIGHTHELMSTONE), a maritime town and favorite watering place in England, county of Sussex, 50½ miles from London. It is situated on a gentle slope, protected from the N. winds by the high ground of the South Downs immediately behind the town, and is well built, with handsome streets, terraces, squares, etc. In front of the town is a massive sea wall, with a promenade and drive over 3 miles in length, one of the finest in Europe. Among the remarkable buildings, all of modern date, is the Pavilion, built by George IV., which cost upward of \$5,000,000. It is in the Oriental style, with numerous cupolas, spires, etc. Brighton has no manufactures, and is resorted to only as a watering-place. It was about the middle of the 18th century that Dr. Russell, an eminent physician, drew attention to Brighton, which subsequently was patronized by George IV., then Prince of Wales; in this way it was converted from a decayed fishing village into a fashionable and populous watering-place. It has sent two members to Parliament since 1832. Pop. about 132,000.

BRIGHT'S DISEASE, a granular disease of the cortical portion of the kidneys, so called because it was first diagnostically described by Dr. Richard Bright, an English physician. It is first emphasized by the secretion of urine containing a large amount of albumen, and this symptom is followed by other complications, usually in rapid sequence. The most commonly observed pathological effects are dropsy, nausea, fever, uræmia, and, in some cases, petrification of the kidneys and ureters.

BRIHUEGA (brē-ā'gwa), a town of Spain, in New Castile, on the Tajuna, 20 miles E. N. E. of Guadalajara. Here

Dec. 9, 1710, the French, under the Duke de Vendôme, defeated the allies commanded by Lord Stanhope.

BRILL, a flat fish, *pleuronectes rhombus*, resembling the turbot, but inferior to it in flavor, besides being smaller in size. It is common in the markets.

BRILLAT-SAVARIN, ANTHELME (bre-yä'-sä-vä-ran'), a French author, born in Belley, April 1, 1755. He was a deputy to the National Convention in 1789; emigrated in 1793; and passed some time in the United States; returned to France in 1796. His title to fame is the work, "Physiology of Taste," an essay on the social implications of gastronomy. He died in Paris, Feb. 2, 1826.

BRIMSTONE, a name of sulphur. Sulphur, in order to purify it from foreign matters, is generally melted in a close vessel, allowed to settle, then poured into cylindrical molds, in which it becomes hard, and is known in commerce as roll brimstone.

BRINDABAN, or **BINDRABAN**, a town of the Northwest provinces, British India; on the left bank of the Jumna, 6 miles N. of Muttra. It is one of the holiest cities of the Hindus, and crowds of pilgrims go there from all parts of India, more particularly in honor of Krishna; and, through the munificence of wealthy devotees, there are a large number of temples and shrines.

BRINDISI (brēn'di-sē); ancient BRUNDUSIUM, a seaport and fortified town, province of Lecce, southern Italy, on the Adriatic, 45 miles E. N. E. of Taranto. In ancient times Brundusium was an important city, and with its excellent port became a considerable naval station of the Romans. Its importance as a seaport declined in the Middle Ages, and was, subsequently, completely lost, until the Peninsular and Oriental Steam Navigation Company put on a weekly line of steamers between Brindisi and Alexandria. From this cause the town has risen to large importance. Pop. about 25,500.

BRINE, water saturated with common salt. It is naturally produced in many places beneath the surface of the earth, and is also made artificially, for preserving meat, a little saltpeter being generally added to the solution.

BRINE SHRIMP, the only animal, except a species of fly (*ephysdra*), which lives in the Great Salt Lake of Utah. It is a phyllopod crustacean, with stalked eyes, a delicate, slender body, which is provided with 11 pairs of broad, paddle-

like or leaflike feet. It is about $\frac{1}{4}$ of an inch long. Similar forms live in brine vats in various parts of the world.

BRINVILLIERS (brān-vē-yā'), **MARIE MARGUERITE, MARQUISE DE**, a notorious French poisoner, born about 1630; was the daughter of Dreux d'Aubray, Lieutenant of Paris, and received a careful education. In 1651, she was married to the Marquis, and formed an improper attachment to St. Croix, a young cavalry officer. The latter was imprisoned in the Bastille, and there learned from Exili, an Italian, the composition of poisons, which art he afterward taught to his mistress. They then commenced a series of poisonings, the first victim being the Marquise's father, then her two brothers and her sister, with a view to the ultimate possession of their fortunes. She fled, but was arrested at Liège, and beheaded, in 1676.

BRIQUETTE (brē-ket'), French for "small brick." A briquette is simply an admixture of coal dust with pitch, molded under pressure and heat, the pitch or some similar substance being introduced to form the cementing material.

BRISBANE, the capital, a seaport and chief seat of trade of Queensland, Australia, situated about 500 miles N. of Sydney, in Moreton District. It stands about 25 miles from the mouth of a river of its own name, which falls into Moreton Bay, and it is divided into the four divisions of North Brisbane, South Brisbane, Kangaroo Point, and Fortitude Valley. Pop. about 145,000. Brisbane possesses broad and handsome streets, and some fine buildings, among the chief of which are the Houses of Legislature, which cost £100,000, the postoffice, telegraph office, the viceregal lodge, and the Queensland National Bank. It is the seat of an Anglican and of a Roman Catholic bishop. There are some 50 churches, the chief being the two cathedrals; and several daily and weekly newspapers are published. The export trade, which is large, includes gold, wool, cotton, sugar, tallow, and hides; and the imports, most of the articles in use among a thriving community. Regular steam communication is kept up with the other Australian ports, as well as with London (11,295 miles), and there is an extensive system of wharfs on both sides of the river.

Brisbane was settled as a penal station, in 1825, by Sir T. Brisbane, Governor of New South Wales. In 1836 the town comprised the houses of the commandant and other officers, barracks, a tread mill, stores, etc. Three years later

the convict settlement was broken up. In 1842, the colony was opened to free settlers. The Brisbane river rises in the Burnett Range, and receives the Bremer and other rivers before its entrance into Moreton Bay, below the town of Brisbane. The Victoria lattice girder bridge (1,080 feet long), connecting North and South Brisbane, was destroyed by a flood, in 1893, which laid half of South Brisbane in ruins.

BRISBANE, ARTHUR, an American editor; born in Buffalo, N. Y., in 1864. His education was a public school one, supplemented by a residence of five years in France and Germany. He entered upon a newspaper career as a reporter for the New York "Sun." Later he became editor of the "Evening Sun," from which he went to a similar position on the "World." In 1897 he became editor of the New York "Evening Journal" and the brilliancy of his editorial writing soon made him a national figure.

BRISEIS (bri-sē'is), a girl of Lyrnessus, called also Hippodamia. When her country was taken by the Greeks, she fell to the share of Achilles in the division of the spoils. Agamemnon afterward took possession of her, and Achilles thereupon made a vow to absent himself from the field of battle at Troy. This incident Homer makes one of the chief features of his "Iliad."

BRISSON, EUGENE HENRI, a French politician and journalist, born in Bourges, July 31, 1835. He entered the Chamber of Deputies, in 1871, and won much attention by urging amnesty for the Communists and other political offenders. He became one of the foremost members of the Radical party. He was elected President of the Chamber, in 1881, and became premier in 1885. He was re-elected to the Presidency of the Chamber in 1894, and, in 1895, he retired from the ministry and was a conspicuous candidate for the Presidency of France. In 1898 he again accepted the premiership, but his cabinet was soon overthrown on the army question. He was President of the House of Deputies in 1906.

BRISSOT (brē-sō'), **JEAN PIERRE** (also called **BRISSOT DE WARVILLE**), a French political writer, born in 1754. In 1780, he published his "Théories des Lois Criminelles," and two years later "Bibliothèque des Lois Criminelles." During the Revolution he made himself known as one of the leaders of the Girondist party. Brissot, like most of his party, died by the guillotine in 1793.

BRISTED, CHARLES ASTOR ("CARL BENSON"), an American author, born in New York City, Oct. 6, 1820. He graduated from Yale University in 1839, and from Trinity College, Cambridge, England, in 1845. He traveled extensively in Europe, and was a frequent contributor to the magazines. Among his works are "Five Years in an English University" (1851); "The Upper Ten Thousand" (1852); "Interference Theory of Government" (1868). He died in Washington, D. C., Jan. 15, 1874.

BRISTLES, the strong hairs growing on the back of the hog and wild boar, and extensively used in the manufacture of brushes, and also by shoemakers and saddlers. Russia, Germany, and in a lesser degree France, Belgium, and the Scandinavian states are large exporters of bristles. The supplies from the United States and East India have risen into importance within the last few years. The quality of bristles depends on the length, stiffness, color, and straightness—white being the most valuable. The best bristles are produced by hogs that inhabit cold countries.

BRISTOL, a town in Hartford co., Conn.; on the New England railroad, 17 miles W. of Hartford. It has a public library, electric light and street railroad plants; National and savings banks; manufactories of clocks, brass goods, table ware, tools, woolen and knit goods, and bicycle and other bells. Pop. (1910) 13,502; (1920) 20,620.

BRISTOL, a borough in Bucks co., Pa.; on the Delaware river, the Pennsylvania railroad and the Pennsylvania canal; 21 miles N. E. of Philadelphia. It has a National bank, high school, electric light and street railroad plants, and a noted mineral spring, and manufactories of carpets, hosiery, and foundry products. It is in a rich fruit and truck farming region, and is the center of considerable trade. Pop. (1910) 9,256; (1920) 10,273.

BRISTOL, town, port of entry, and county-seat of Bristol co., R. I.; on Narragansett Bay and the New York, New Haven and Hartford railroad, 15 miles S. E. of Providence. It has an excellent harbor, facilitating a large daily passenger and freight service for Fall River and Providence. It is the seat of the widely known Herreshoff shipbuilding works, where a number of noteworthy sailing and steam yachts and torpedo boats have been constructed; and also of the Saunders & West yacht building yards. The town has large

market gardening and coast trade interests and manufactories of rubber, woolen, and cotton goods. Bristol is the site of the residence of King Philip, the great Narragansett chief. Pop. (1910) 8,565; (1920) 11,375.

BRISTOL, a city in Sullivan co., Tenn., and Washington co., Va.; on several railroads; 130 miles E. by N. E. of Knoxville. The boundary line between Tennessee and Virginia runs E. and W. along the main street of the city. Bristol is the seat of King's College (Presbyterian), Sullins College, and the Southwest Virginia Institute for young ladies; and is principally engaged in the manufacture of tobacco, cotton and woolen goods, iron, lumber, and leather. Pop. (1910) 7,148; (1920) 8,047.

BRISTOL, a cathedral city of England, a municipal and a parliamentary borough, situated partly in Gloucestershire, partly in Somersetshire, but forming a county in itself. It stands at the confluence of the rivers Avon and Frome, which unite within the city, whence the combined stream (the Avon) pursues a course of nearly 7 miles to the Bristol Channel. The town is built partly on low grounds, partly on eminences, and has some fine suburban districts, such as Clifton, on the opposite side of the Avon, and connected with Bristol by a suspension bridge 703 feet long and 245 feet above high water mark. Notable among buildings are the cathedral, founded in 1142, exhibiting various styles of architecture, and recently restored and enlarged; St. Mary Redcliff, said to have been founded in 1293, and perhaps the finest parish church in the kingdom. Among modern buildings are the exchange, the guild hall, the council house, the post-office, etc. The charities are exceedingly numerous, the most important being Ashley Down Orphanage, for the orphans of Protestant parents, founded by the late George Müller. Bristol has a number of endowed schools, the principal of which are the grammar school, Queen Elizabeth's Hospital, the Red Maids' School (which educates and provides for 80 girls, and gives them marriage portions), Colston's Hospital, the Trade School, and the Cathedral School. Among the educational institutions are the University College, the Theological Colleges of the Baptists and Independents, Clifton College, and the Philosophical Institute. There is a school of art, and also a public library. Bristol has glass works, potteries, soap works, tanneries, sugar refineries, and chemical works, ship building and machinery

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yards. Coal is worked extensively within the limits of the borough.

In old Celtic chronicles we find the name Caer Oder, or "the City of the Chasm," given to a place in this neighborhood, a name peculiarly appropriate to the situation of Bristol, or rather of its suburb, Clifton. The Saxons called it Brigstow, "bridge-place." In 1373, it was constituted a county of itself by Edward III. It was made the seat of a bishopric by Henry VIII., in 1542 (now united with Gloucester). In 1831, the Reform agitation gave origin to riots that lasted for several days. The rioters destroyed a number of public and private buildings, and had to be dispersed by the military. Sebastian Cabot, Chatterton, and Southey were natives of Bristol. Pop. about 365,000.

BRISTOL, FRANK MILTON, a Methodist Episcopal bishop, born in Orleans co., N. Y., in 1851. He studied for the ministry and held important pastorates in Chicago and Washington. He was elected bishop in 1908. He is an eloquent preacher and voluminous writer. Among his publications are "Shakespeare and America," "Providential Epochs," and "The Ministry of Art."

BRISTOL BAY, an arm of Bering Sea, lying immediately to the N. of the peninsula of Alaska, receives the waters of two large lakes, by which communication with the interior is opened up for a considerable distance.

BRISTOL CHANNEL, an arm of the Atlantic, extending between the S. shores of Wales and the S. W. peninsula of England, and forming the continuation of the estuary of the Severn. It is remarkable for its high tides.

BRISTOL, or BRISTOW, DIAMOND, a species of rock crystal, sometimes colored, sometimes transparent. It is found chiefly in the St. Vincent rocks near Bristol, and is also known as Bristol stone.

BRISTOW, JOSEPH LITTLE, American newspaper editor; born in Wolfe co., Ky., July 22, 1861. He was graduated at Baker University, Kansas, in 1886; was clerk to the district court, Douglas co., Kan., from 1886 to 1890; owned and edited the Salina (Kan.) "Daily Republican" from 1890 to 1895; bought the Ottawa (Kan.) "Herald" in 1895; was private secretary to Governor Morrill of Kansas in 1895-7; and from 1894 to 1898 was secretary to the Republican State Commission of Kansas. Bristow was assistant postmaster-general from 1897 to 1905, and in 1900 was com-

missioned to superintend the investigation of Cuban postal frauds and the reorganization of the Cuban postal service. He again bought the Salina "Daily Republican Journal" in 1903 and continued editing it until 1909, when he was elected United States senator, serving until 1915. He was defeated for re-election and was appointed chairman of the Kansas Utilities Commission, on which he served until 1918.

BRISTOW STATION (old form, now BRISTOE), a village in Prince William co., Va.; 4 miles S. W. of Manassas Junction. On Aug. 27, 1862, a drawn battle took place here between the Federal army, under General Hooker, and a Confederate one, under General Early, and on Oct. 14, 1863, the Federal troops, under General Warren, repulsed with severe loss a Confederate attack under General A. P. Hill.

BRITAIN. See GREAT BRITAIN.

BRITANNIA, the name applied by Caesar and other Roman writers to the island of Great Britain; Aristotle having referred to the *Nēsoi Bretannikai* (British Isles) as early as the 4th century B. C.

BRITANNIA METAL, an alloy of brass, tin, antimony, and bismuth. It is used to make cheap spoons and teapots.

BRITANNICUS, son of the Emperor Claudius, by his third wife, Messalina. His original name was Tiberius Claudius Germanicus, to which was subsequently added Britannicus, from the conquests which were made in Britain. He died in 56; poisoned by Nero in his 14th year.

BRITISH COLUMBIA, a Province (including Vancouver Island) of the Dominion of Canada, bounded on the N. by the 60th parallel of lat.; E. by the Rocky Mountains; S. by the United States; and W. by Alaska, the Pacific Ocean, and Queen Charlotte's Sound; area, 312,630 square miles; pop. about 400,000; capital, Victoria (pop. about 45,000).

Topography.—The coast line is much indented, and is flanked by numerous islands, the Queen Charlotte Islands being the chief after Vancouver. The interior is mountainous, being traversed by the Cascade Mountains near the coast, and by the Rocky Mountains farther E. There are many lakes, generally long and narrow, and lying in the deep ravines that form a feature of the surface, and are traversed by numerous rivers. Of these, the Fraser, with its

tributary, the Thomson, belongs entirely to the Province, as does also the Skeena; while the upper courses of the Peace river and of the Columbia also belong to it. All except the Peace find their way to the Pacific. Its mountain ranges (highest summits: Mount Hooker, 15,700 feet, and Mount Brown, 16,000 feet) afford magnificent timber (including the Douglas pine and many other trees); and between the ranges are wide, grassy prairies. The climate is mild in the lower valleys, but severe in the higher levels; it is very healthful.

Mineralogy.—It is to its mineral wealth that British Columbia owes its present importance. Gold was discovered in 1857, and was the cause of the establishment of the separate colony. In 1897, the disclosing of the phenomenal gold field in the Klondike region led to great excitement throughout both Canada and the United States. The rapid development of the mines has led to great improvements in smelting operations. The estimated mineral production in 1919 was as follows: gold, 150,050 ounces; silver, 3,261,297 ounces; copper, 46,546,815 pounds; lead, 17,804,470 pounds; and zinc, 13,649,000 pounds.

Soil.—The soil varies from a deep black to a light brown loam. The northern section is exceedingly fertile, and all the Canadian fruits, vegetables, and cereals yield more abundantly than in any other part of the Dominion. In the southern and middle parts, the land is well adapted to pasturage, and, with proper irrigation, to agriculture. In these parts, land 1,700 feet above sea level has produced, under irrigation, 40 bushels of wheat to the acre. The Province contains an abundance of forest land, yielding timber of high commercial value. A noteworthy specimen is the Douglas fir, a tree of great size, often from 150 to 300 feet in height, and celebrated for its straightness. Lumber 90 feet long and 48 inches square has been cut from these trees. At Burrard Inlet are pines measuring 27 and 30 feet in diameter. The Government leases its timber land.

Industries.—There were in 1917 1,772 industrial establishments, with a capital of \$221,436,100, and 36,242 employees. The wages paid amounted to \$32,882,006, and the value of the completed products amounted to \$171,425,616.

Agriculture.—The value of the crop production in 1919 was \$99,444,308. There were in the same year 43,717 horses; 246,238 cattle; 44,985 sheep; 44,960 swine; and 1,181,021 poultry.

Fisheries.—This Province has prob-

ably the richest fisheries in the world, the only obstacle to their rapid development being their remoteness from the consumers. Salmon is the principal catch, and is famous all over the world. Sturgeon, weighing as much as 500 pounds, are plentiful. Other fish that abound in British Columbia are cod, halibut, anchovies, herring, etc. British Columbia in 1918 contributed over 40 per cent. of the total value of the fisheries of Canada. The value of the plants engaged in the industry was \$15,807,058. These employed over 20,000 persons. The value of the product was \$28,329,501. The salmon packed in 1919 was valued at \$15,000,000. Of this 75 per cent. were exported to Great Britain.

Commerce.—The imports in the year 1918-1919 were valued at \$63,694,691, and the exports to \$77,247,666. There were in 1919 214 bank branches.

Education.—Education is free, non-sectarian and compulsory. There are 419 schools and colleges with an enrolment of 64,570 pupils and employing 2,064 teachers.

Finances.—The revenues total about \$10,000,000 annually. The chief sources of revenue are Dominion subsidies, timber licenses, taxes of real and personal property, income tax, and succession duties.

Government.—The public affairs of British Columbia are administered by a Lieutenant-Governor, appointed by the Canadian Governor-General in Council, and a ministry of 5 members, and a Legislative Assembly of 49 members, elected for a term not exceeding four years. British Columbia sends 3 members to the Dominion Senate, and 13 to the House of Commons. Justice is dispensed by a chief justice and four assistant justices.

History.—British Columbia was originally a portion of the Hudson's Bay Territory, and known as New Caledonia. In 1858, it was created a colony; in 1866, the colony of Vancouver Island was united to it; and in 1871, the united colony was admitted to the Dominion of Canada.

BRITISH EAST AFRICA, called since July 5, 1920, Kenya Colony, a territory of East Africa, between the former German East Africa and the Italian protectorate of Somaliland; area, over 1,000,000 square miles; pop. estimated at between 2,000,000 and 3,000,000. The coast extends from Wanga, 4° 40' S. lat., to the mouth of the Juba river, 0° 15' S. lat. The S. boundary line runs to a point, on 1° S. lat. on Lake Vic-

toria Nyanza, and continues on that parallel to 30° E. long., when it turns N. to Darfur and Kordofan, including these countries. The territory contains the valley of the Upper Nile and the mountainous region of Equatorial Africa, in which are the high mountains of Kenia, Elgon, and Ruwenzori. The inhabitants comprise Bantu tribes, among which are the Waganda and Wangoro, Musai and Galla tribes, Swahili on the coast, and negroes on the Nile. Ivory, gum, India rubber, sesame seeds, cocoanuts, copra, coir, maize, rice and hides are exported. The government is principally vested in the British East Africa Company, which was founded in 1888, with a royal charter, but in 1894 UGANDA (*q. v.*), N. of Victoria Nyanza, was made a separate British protectorate, and received a separate administration. DARFUR (*q. v.*) and KORDOFAN (*q. v.*) were merely in the sphere of British influence, by agreement with Germany and Italy. The British East Africa Company is rapidly opening up the country, constructing roads and telegraphs, and taking steps to suppress slavery and the slave trade. The seat of administration is at MOMBASA (*q. v.*). The coast is unhealthy for Europeans, but most of the interior plateaus are salubrious. Consult Payne's "British East Africa" (1910).

BRITISH EMPIRE, THE, includes, under some form of government, the following: In Europe, the United Kingdom, the Isle of Man, the Channel Islands, Malta, and Gibraltar; in Asia, the Indian Empire, Ceylon, the Straits Settlements, the Federated Malay States, other Malay states, Hong Kong, Wei-hai-wei, North Borneo, Brunei, Sarawak, and Cyprus; in Africa, Cape Province, Natal, Transvaal, Orange Free State, South West Province, Basutoland, Bechuanaland, Rhodesia, Gambia, Gold Coast, Sierra Leone, Northern and Southern Nigeria, the former German West Africa, East Africa, Uganda, Zanzibar, Nyasaland, Egypt, Sudan, Mauritius, Seychelles, Ascension, and St. Helena; in America, Canada, Newfoundland, Jamaica, the Bahamas, Leeward Islands, Windward Islands, Barbadoes, Trinidad and Tobago, British Guiana, British Honduras, Bermuda, the Falkland Islands, and South Georgia; in Australasia, Australia, Tasmania, New Zealand, Fiji Islands, Papua, and the Pacific Islands. The following table gives the area and the estimated population of the Empire for 1919:

	Continental Distribution	English Square Miles	Estimated Population
Europe.....	121,512	45,878,500	
Asia.....	2,187,550	323,158,000	
Africa.....	4,652,000	60,000,000	
North America.....	3,893,000	7,458,000	
Central America.....	8,600	50,000	
West Indies.....	12,300	1,730,000	
South America.....	97,800	314,000	
Australasia.....	3,300,000	6,800,000	
Total	14,272,762	445,388,500	

Details of the various constituent parts of the Empire will be found under their titles throughout this work.

BRITISH GUM, a substance of a brownish color, and very soluble in cold water, formed by heating dry starch at a temperature of about 600° F.

BRITISH MUSEUM, the great National Museum in London owes its foundation to Sir Hans Sloane, who, in 1753, bequeathed his various collections, including 50,000 books and manuscripts, to the nation, on the condition of £20,000—less by £30,000 than the original cost—being paid to his heirs. Montague House, which was bought for the purpose for £10,250, was appropriated for the museum, which was first opened on Jan. 15, 1759. The original edifice having become inadequate, a new building in Great Russell street was resolved upon in 1823, the architect being Sir R. Smirke, whose building was not completed till 1847. In 1857, a new library building was completed and opened at a cost of £150,000. It contains a circular reading room 140 feet in diameter, with a dome 106 feet in height. This room contains accommodations for 300 readers comfortably seated at separate desks. The accommodation having become again inadequate the natural history department was lodged in a new Natural History Museum at South Kensington. Further additions to the Great Russell street buildings were made in 1882. The British Museum is under the management of 48 trustees. It is open daily, free of charge. Admission to the reading room as a regular reader is by ticket, procurable on application to the chief librarian. The library, which is now one of the largest and most valuable in the world, has been enriched by numerous bequests and gifts, among others the splendid library collected by George III. during his long reign. A copy of every book, pamphlet, newspaper, piece of music, etc., published anywhere in British territory, must be conveyed free of charge to the British Museum. The museum contains eight principal departments, namely, the department of printed books, maps, charts, plans, etc.; the department of manu-

scripts; the department of natural history; the department of Oriental antiquities; the department of Greek and Roman antiquities; the department of coins and medals; the department of British and medieval antiquities and ethnography; and the department of prints and drawings.

BRITISH NORTH AMERICA, a name under which are included the Dominion of Canada and the colony of Newfoundland, comprising all the mainland N. of the United States (except Alaska) and a great many islands.

BRITISH SOMALILAND. See SOMALILAND PROTECTORATE.

BRITISH SOUTH AFRICA. See SOUTH AFRICA, UNION OF.

BRITISH SOUTH AFRICA COMPANY, a corporation founded in 1889, with a royal charter, by Cecil Rhodes and others, for the purpose of controlling, settling, administering and opening up by railways and telegraphs, etc., certain territories in central south Africa. Mashonaland was first settled, and, in 1893, Matabeleland was annexed and settled after the defeat of King Lobengula. In 1895, North Zambezia, in British Central Africa, was added, as well as a strip of territory in the Bechuanaland Protectorate. This territory has been called Rhodesia, or British Zambezia; area, about 500,000 square miles. In consequence of the filibustering raid of Dr. Jameson, an officer of the company, near the close of 1895, Rhodes resigned his connection with the company in 1896, and a joint administrator of the territory was appointed by the British crown.

BRITTANY. See BRETAGNE.

BRIZA (Quaker grass), a genus of grasses with panicles consisting of awnless spikelets much compressed laterally, and cordate deltoid in form.

BROACH, or **BAROACH**, a town in Guzerat (Gujerat), Hindustan, on the Nerbudda, one of the oldest seaports of western India, with a considerable coasting trade. The town was taken by storm by the British in 1772, and, with the district, ceded to them by treaty with Scindia, in 1803. Pop. 45,000.

BROAD BILL, a species of wild duck, *anas clypeata*: the shoveler; also the spoon bill, *platalea leucorodia*.

BROAD MOUNTAIN, a mountain ridge of Pennsylvania, in Carbon and Schuylkill counties, about 50 miles long.

BROAD RIVER, a river of North Carolina, rising in the Blue Ridge Mountains, and making a junction with the Saluda at Columbia to form the Congaree; about 200 miles long.

BROADS, THE NORFOLK, a series of English inland lakes, usually said to be formed by the widening or broadening out of the rivers. The broads *par excellence* are those up the Bure or North river (which empties itself into the sea at Yarmouth), and its tributaries, the Ant and the Thurne. On the Bure leaving the comparatively hilly land N. of Wroxham, it enters a flat, marshy country very little above high-water mark, and right and left of it are the well known broads of Wroxham, Salhouse, Hoveton, Horning and Ranworth. The first (Wroxham) is the largest and deepest, there being sailing water for large boats all over it. Up the Ant there is the fine broad at Barton and another at Sutton; but the latter is fast closing up. Up the Thurne there is a very large broad at Hickling, and two others at Martham and Horsey, and these are all of note in the E. part of the county, on which it is possible to sail; for the three fine broads at Ormesby, Rollesby and Filby, though connected and forming a chain, have no practicable outlet to the river. The Yale, or Norwich, river has no broads on which sailing is possible. Near Lowestoft, on the Waveney, is Oulton Broad. The broads have grown greatly in favor with holiday makers in recent years.

BROAD TOP MOUNTAIN, a mountain in Bedford and Huntington counties, Pennsylvania; extensively mined for anthracite coal. Height about 2,500 feet.

BROADWAY, the great business street of New York. Starting from Bowling Green, at the lower extremity of the island, it runs northward in a somewhat diagonal direction, separating the city into substantially equal eastern and western parts. Its continuous course is interrupted by two public squares, Union Square, at 14th street, and Madison Square, at 23d street. Below Union Square it is devoted mainly to office buildings and wholesale establishments. Above Madison Square (where it intersects Fifth avenue and 23d street) are chiefly retail establishments and office buildings. The section from 42d to 59th street forms the chief hotel and theater section of the city. The same thoroughfare extends to Albany, N. Y., following the course of the old post-road. Its length below 59th street is about 5 miles, and it is traversed throughout by an electric railway.

Two subway systems run underneath Broadway for a considerable portion of its length.

BROCA, PAUL (brō-kä), a French anthropologist, born in Gironde, Jan. 28, 1824; studied medicine and became Professor of Pathology at Paris, and famous as a surgeon; was founder of the Anthropological Society of Paris; founder of the Anthropological Institute or School, and founder and editor of the "Anthropological Review"; wrote several monographs on strangulation and hernia, aneurisms, anaesthesia, abscesses, hybrids, and various anthropological subjects; was leader of the Evolutionist School in France, and became a life Senator. He died in Paris, July 9, 1880.

BROCADE, a kind of silken stuff, variegated or embossed with gold or silver flowers or other ornaments. The manufacture of brocades was established at Lyons in 1757.

BROCCOLI, a late variety of the cauliflower, hardier and with more color in the flower and leaves. The part used is the succulent flower stalks.

BROCH (brōch), a name for certain prehistoric structures in Scotland resembling low, circular, roofless towers, with walls of great thickness, built of unhewn stones and without lime or cement, and entered by a narrow passage. There are small chambers in the thickness of the wall, accessible only from the interior. These structures were evidently built for defense. They are most numerous in Orkney, Shetland, and the northern counties.

BROCHANTITE (from BROCHANT DE VILLIERS, a French mineralogist), an orthorhombic transparent or translucent mineral, with its hardness, 3.5-4; its sp. gr., 3.78-3.90; its luster vitreous, pearly, on one cleavage face. Composition: Sulphuric acid, 15.8-19.71; oxide of copper, 62.626-69.1; oxide of zinc, 0.8-1.181; oxide of lead, 1.03-1.05. It is found in all portions of the world. It can be produced artificially. Dana makes two varieties—(1) Ordinary brochantite. (2) Warringtonite, with which brongartine may be classified.

BROCK, SIR ISAAC, a British military commander, born in Guernsey, Oct. 6, 1769; suppressed a threatened mutiny in Canada in 1802; made Lieutenant-Governor of upper Canada in 1810; took Detroit from the Americans under General Hull in 1812; and was killed at the battle of Queenstown, Oct. 13, 1812. A monument to his memory stands on the W. bank of the Niagara river.

BROCKEN, the culminating point of the Hartz Mountains, in Prussian Saxony, north Germany, cultivated nearly to its summit, which is 3,740 feet above the level of the sea. The phenomenon called the "Specter of the Brocken" is caused by the perpendicular rising of the mists from the valley opposite to the sun, at the same time leaving the top of the mountain clear. The effect produced is a wonderful enlargement of every object reflected by this dense mass of vapor ascending from the valley.

BROCKHAUS, FRIEDRICH ARNOLD (brok'-hous), a German publisher, born in Dortmund, May 4, 1772. In 1811 he settled at Altenberg, where the first edition of the "Conversations-Lexikon" was completed, 1810-1811. The business rapidly extended, and he removed to Leipsic in 1817. There are now chief branches in Berlin and Vienna. He died Aug. 20, 1823.

BROCKTON, a city in Plymouth co., Mass.; on the New York, New Haven and Hartford railroad; 20 miles S. of Boston. It is one of the largest boot and shoe manufacturing places in the country, and beside these articles has extensive manufactories of rubber goods, shoe machinery and supplies, tools and bicycles. It contains the villages of Campello, Montello, Marshall's Corner, Brockton Heights, Clifton Heights, and Salisbury Square; was settled in 1700; was incorporated as a town in 1821, and chartered as a city in 1881. There are 2 National and 2 savings banks, a public library and excellent public schools. Pop. (1910) 56,878; (1920) 66,254.

BROCKVILLE, town, port of entry, and county-seat of Leeds co., Ontario, Canada; on the St. Lawrence river, below the Thousand Islands, and the Grand Trunk, the Canadian Pacific, and the Brockville and Sault Ste. Marie railroads; 125 miles S. W. of Montreal. It is a port of call for the St. Lawrence steamers. There are manufactories of agricultural implements, gloves, cigars, leather, sulphuric acid, and foundry and machine shop products. It is named for Gen. Sir Isaac Brock (1769-1812), an English officer killed in the battle of Queenstown. Pop. about 10,000.

BROGLIE (brōl-yē' or brō-glē'), a prominent French family, of Piedmontese origin; its most important members have been the three dukes of the name: (1) FRANCOIS MARIE, first Duc de, Marshal of France, born in 1671, took part in every campaign from 1689, and died in 1745. (2) VICTOR FRANCOIS, his son, born in 1718, was the most capable

of the French commanders in the Seven Years' War. Made a Marshal in 1797, he entered the Russian service after the Revolution, and died in 1804. (3) ACHILLE CHARLES LÉONCE VICTOR, grandson of the last, and son of Prince Claude Victor (born in 1757, guillotined in 1794), born in 1785, was distinguished as a Liberal politician and an earnest advocate for the abolition of slavery. He was Foreign Secretary (1832-1834) and Prime Minister (1835-1836) under Louis Philippe; after 1851 he lived in retirement, and died in Paris, Jan. 25, 1870. He was a member of the Academy, and published "Écrits et Discours" (3 vols., 1863), while the fourth and last volume of his "Souvenirs" appeared in 1887.

BROGUE, a brogan; a stout, heavy leather shoe, resembling in form the French *sabot*. Applied generally to the pedal coverings of the Scottish Highlanders and the Irish peasantry. It is also applied to a corrupt dialect, or mode of pronunciation; as, spoken with the Irish brogue.

BROKER, an agent employed to make bargains and contracts between other persons, in matters of commerce, for a compensation commonly called brokerage. The broker is strictly a middleman, or intermediate negotiator between the parties, finding buyers or sellers as required. He does not act in his own name, nor has he generally the custody of the goods in which he deals, thus differing from a factor, and he cannot sell publicly like an auctioneer. Besides ordinary commercial brokers, there are several other sorts, such as stockbrokers, share-brokers, ship-brokers, insurance-brokers, bill-brokers, etc.

BROMBERG, a town in the Polish province of Posen, on the Brahe, 6 miles from its influx to the Vistula, and 99 miles S. S. W. of Danzig by rail. Before the World War it had iron foundries, machine shops, and manufactures of cloth and paper, distilleries, breweries and corn mills. There was a considerable provincial trade both by shipping and railway. The Bromberg canal, 17 miles long, by uniting the rivers Netz and Brahe, connects the Oder and Elbe with the Vistula. Pop. about 58,000.

BROME GRASS, the English book name for the genus *BROMUS* (*q. v.*).

BROMELIA (named after BROMELIUS, who published a Gothic flora), a genus of plants, the typical one of the order *bromeliaceæ*.

BROMELIACEÆ, bromelworts, an order of endogenous plants, placed by Dr. Lindley under his narcissal alliance. The calyx is sometimes herbaceous looking, but sometimes colored. Petals, three, colored; stamens, six or more; ovary, three celled, many-seeded, as is the fruit, which is capsular or succulent. The stem is wanting or, if present, very short. Lindley estimated the known species at 170, all American. They have been introduced into Africa, the East Indies, and elsewhere. The well known pineapple is the *bromelia ananas*. Ropes are made in Brazil from another species of the same genus. All the species of bromeliaceæ can exist without contact with the earth.

BROMIDE, a combination of bromine with a metal or a radical. Bromides are soluble in water, except silver and mercurous bromides; lead bromide is very slightly soluble. They are detected in analysis by the following reactions: Argentite nitrate gives a yellowish precipitate of AgBr, insoluble in dilute nitric acid, and soluble in strong ammonia. Chlorine liberates bromine, and, if the liquid is shaken up with ether, a yellow ethereal solution floats on the liquid. Heated with sulphuric acid and MnO₂, bromides yield vapors of Br, which turns starch yellow.

BROMINE, a non-metallie element. Symbol Br; atomic weight, 79.4. Bromine was discovered in 1826 by Balard, in the salts obtained by the evaporation of sea water. Bromine is liberated from the sodium and magnesium salts by the action of free chlorine, and is separated by ether, which dissolves the bromine. This red-colored solution is removed, saturated with potash, evaporated, and heated to redness, and the bromide of potassium is heated with manganese dioxide and sulphuric acid. The bromine is liberated in the form of a deep red vapor, which condenses into a dark, reddish black liquid. Specific gravity, 2.97, it boils at 63°; its vapor density is 5.54 times that of air. It has an irritating smell, and when inhaled is poisonous. It dissolves in 30 parts of water, and the solution has weak bleaching properties. Bromine and hydrogen do not unite in the sunlight, but do when they are passed through a red hot porcelain tube, forming hydrobromic acid (HBr), which is also obtained by the action of phosphorus and water on bromine. It is a colorless, fuming gas, which liquefies at 73°, very soluble in water. The concentrated solution contains 47.8 per cent. of HBr, it boils at

126*, and has powerful acid properties; it neutralizes bases, forming bromides and water. Hypobromous acid, HBrO , is only known in solutions; it has bleaching properties. Bromine can displace chlorine from its compounds with oxygen, while chlorine can liberate bromine from its compound with hydrogen. Free bromine turns starch yellow.

Bromine has been applied externally as a caustic, but rarely. Its chief officinal preparations are bromide of ammonium, useful in whooping cough, infantile convulsions, and nervous diseases generally; and bromide of potassium, now very extensively used, especially in epilepsy, hysteria, delirium tremens, diseases of the throat and larynx, bronchocele, enlarged spleen, hypertrophy of liver, fibroid tumors, etc. Also, as an antaphrodisiac, for sleeplessness, glandular swellings, and skin diseases. Its alterative powers are similar to but less than those of the iodides. Its preparation is the same as iodide of potassium, substituting an equivalent quantity of bromine for iodine— $6\text{KHO} + \text{Br}_2 = 5\text{KBr} + \text{KBrO}_3 + 3\text{H}_2\text{O}$.

BROMUS (brome grass), a genus of grasses having two unequal glumes and two herbaceous glumelles, the outer one bifid and with an awn from below the extremity. The seeds of *B. mollis*, or soft brome grass, when eaten by man or the larger animals, produce giddiness, and they are said to be fatal to poultry. *B. secalinus*, or smooth rye brome grass, is common in rye and wheat fields.

BRONCHI (-ke), the two branches into which the trachea or windpipe divides in the chest, one going to the right lung, the other to the left, and ramifying into innumerable smaller tubes—the bronchial tubes.

BRONCHITIS, inflammation of the air tubes leading to the pulmonary vesicles, accompanied by hoarseness, cough, increase of temperature, and soreness of the chest anteriorly. The natural mucous secretion is at first arrested, but increases afterward, and is altered in quality, becoming more corpuscular. Its forms are: (1) Acute bronchitis, (a) of the larger and medium sized tubes; (b) capillary bronchitis, and bronchitis of the tubes generally—the *peri-pneumonia notha* of the older writers. (2) Chronic bronchitis. (3) Plastic bronchitis. (4) Mechanical bronchitis, such as knife grinder's disease—carbonaceous bronchitis or black phthisis. (5) Bronchitis secondary to general diseases, such as measles or typhoid fever. (6) Bronchitis secondary to

blood diseases. (7) Syphilitic bronchitis. All varieties are generally preceded by feverishness, but oftener by "a cold in the chest." The uneasy sensations begin about the region of the frontal sinuses, passing from the nasal mucous passages, trachea, and windpipe to the chest, with hoarseness, cough, and expectoration; but in capillary bronchitis the cough is dry and without expectoration. In acute cases the sputum is first thin, then opaque and tenacious, lastly purulent; the breathing is hurried and laborious, the pulse quickened, and the skin dry. The danger increases in proportion as the finer bronchial tubes become involved, and, instead of the healthy respiratory sound we have sharp, chirping, whistling notes, varying from sonorous to sibilant. Chronic bronchitis, or bronchial catarrh, is extensively prevalent, especially among the aged, recurring once or twice a year in spring or autumn, or both, till it becomes more or less constant all the year round.

BRONCHOCELE, an indolent tumor on the forepart of the neck caused by enlargement of the thyroid gland, and attended by protrusion of the eyeballs, anaemia, and palpitation.

BRONI, a town of northern Italy, with mineral springs, 11 miles S. E. of Pavia. Near by is the castle of Broni, where Prince Eugène obtained a victory over the French in 1703.

BRONTÉ (bron'tē), a town of Sicily, at the W. base of Mt. Etna, 33 miles N. W. of Catania. The lava streams of 1651 and 1843 lie on either side, but the district around is fertile, and produces wine. Lord Nelson was created Duke of Bronté by the Neapolitan Government in 1799.

BRONTE, ANNE, an English novelist and poetess, born in Haworth, Yorkshire, March 24, 1820; sister of CHARLOTTE BRONTÉ. Under the pen name of ACTON BELL she wrote "Agnes Grey" (1847), and "The Tenant of Wildfell Hall" (1848). She died in Scarborough, May 28, 1849.

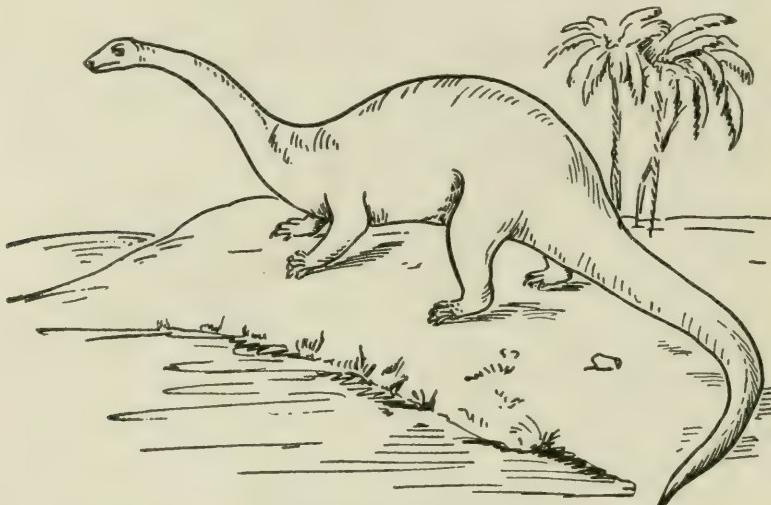
BRONTÉ, CHARLOTTE (afterward MRS. NICHOLLS), an English novelist, born in Thornton, Yorkshire, April 21, 1816; was the third daughter of the Rev. Patrick Brontë, rector of Thornton, from which he removed in 1820 on becoming incumbent of Haworth, in the West Riding of Yorkshire, about 4 miles from Keighley. Her father, an able though eccentric man, brought up Charlotte and her sisters in quite a Spartan fashion,

inuring them to every kind of industry and fatigue. Charlotte became a teacher, and then a governess in a family. In 1842 she went with her sister Emily to Brussels to learn French and German, and she subsequently taught in the school they attended. In 1844 arrangements were entered into by the three sisters to open a school at Haworth, but it was a failure. They resolved now to turn their attention to literary composition; and, in 1846, a volume of poems by the three sisters was published, under the names of CURRER, ELLIS and ACTON BELL. It was issued at their own risk, and attracted little attention, so they abandoned poetry for prose fiction, and produced each a novel.

Bell Nicholls, but in nine months died of consumption, March 31, 1855.

BRONTË, EMILY JANE, an English novelist; sister of CHARLOTTE and ANNE BRONTË, born at Thornton, Yorkshire, Aug. 20, 1818; lived most of her life at Haworth parsonage. Her pen name was ELLIS BELL. "Wuthering Heights" (1847), a powerful but morbid novel, was her chief work. She died in Haworth, Dec. 19, 1848.

BRONTOSAURUS EXCELSUS, a species of herbivorous dinosaur of the Triassic and Jurassic periods. It is supposed to have been a hippopotamus-like animal, and to have lived on vegetation in the waters. It was about 60 feet



BRONTOSAURUS EXCELSUS

Charlotte (CURRER BELL) entitled her production "The Professor," but it was everywhere refused by the publishing trade, and appeared after her death. EMILY (ELLIS BELL) with her tale of "Wuthering Heights," and ANNE (ACTON BELL) with "Agnes Grey," were more successful. Charlotte's failure, however, did not discourage her, and she composed the novel of "Jane Eyre," which was published in October, 1847. Its success was immediate and decided. Her second novel of "Shirley" appeared in 1849. Previous to this she had lost her two sisters, Emily dying on Dec. 19, 1848, and Anne May 28, 1849 (after publishing a second novel, the "Tenant of Wildfell Hall"). In the autumn of 1852 appeared Charlotte's third novel, "Villette." Shortly after, she married her father's curate, the Rev. Arthur

long, and 15 feet high at the middle of the body, and, although its body was of this great size, it had one of the smallest heads known among vertebrates.

BRONTOTHERIUM, or TITANOTHERIUM, a genus of the extinct mammals first found in the Bad Lands of South Dakota, and later in Nebraska and Colorado. The formation is Miocene and the genus is but one of an extinct family of herbivorous mammals. It had the following features: The skull was long and depressed, with a large pair of horn cores, placed transversely on the maxillary bones, in front of the orbits; the nasal bones, which were greatly developed and firmly co-ossified, protruded over the nasal orifice; the brain cavity was small and did not extend over the cerebral hemispheres or the cerebellum,

and but little over the olfactory lobes; neck was of medium length and stout; axis was large and extended transversely, being massive, with odontoid process stout and conical; lumbar were slender and not as large as the dorsals, and there were four sacral vertebræ; a long and slender tail, indicated by the caudals; limbs somewhat shorter than the elephant's; radius separated from the ulna; carpal bones short and supporting four toes; tibia separated from the fibula; three toes of almost equal size on the hind foot; the bones all solid. The brontotherium was about the size of the elephant. The nose was evidently flexible, but there was no true proboscis.

Eastern world was brought from Cornwall or from the peninsula of Malacca. The word is also applied to a style of calico printing peculiar rather from the character of its colors than from any specific novelty in treatment.

BRONZE AGE, the age of bronze, the second of three ages believed by M.M. Nilsson, Steenstrup, Forchhammer, Thomsen, Worsæe and other Danish archæologists to have followed each other in the peninsula of Jutland and elsewhere in the following order: (1) The stone age, (2) the bronze age, and (3) the iron age. During the first, stone, or sometimes bone, was used for weapons



BRONTOTHERIUM

BRONX, THE, a borough of Greater New York, lying N. and E. of the borough of Manhattan, between the Hudson river, East river, and Long Island Sound, including City, Riker's, Hunter's, Twin, Hart, High and several adjacent islands; area, 25,270 acres; pop. (1920) 732,016. The Bronx contains an extensive public park, with a botanical garden of 250 acres, and is the site of the New York Zoological Gardens. See NEW YORK.

BRONZE, an alloy composed of copper and tin, sometimes with a little zinc and lead. It is harder and more fusible than copper itself. The proportions of the two constituents vary according to the purpose for which the alloy is produced. It oxidizes very slowly, even when the air is moist, which renders it well adapted for statues and similar works of art. Bronze was in use in ancient China, Egypt, Assyria, Europe and Mexico. The tin used in parts of the

or implements, the working of metal being as yet unknown. Then weapons were made of bronze, the method of alloying the two metals having been discovered, but that of working in iron being undiscovered. Finally iron took the place of bronze. These views have been generally adopted by geologists and archæologists, though some believe an age of copper to have intervened between those of stone and bronze. Lake dwellings of the bronze period have been found in western and central Switzerland, and one has been discovered in the Lake of Constance. Geologically, even the stone age belongs only to the recent period.

BRONZED SKIN, a peculiar discoloration of the skin frequently associated with Addison's disease, which is a disease of the supra-renal capsules.

BRONZE WING and **BRONZE PIGEON**, names given in the Australian

colonies to certain kinds of wild pigeon, on account of the lustrous bronze color with which their wings are variously marked.

BRONZING, the process of giving a bronze-like or antique metallic appearance to the surface of metals or plaster casts. The processes vary; they may be classed as coating with a melted alloy; coating with a metal in paste, solution, or vapor; corrosion; coating with a gum, application of bronze powder, and painting.

BROOCH, a kind of ornament worn on the dress, to which it is attached by a pin stuck through the fabric. They are usually of gold or silver, often worked in highly artistic patterns and set with precious stones. Brooches are of great antiquity, varied in form as much as in modern times, and were formerly worn by men as well as women, especially among the Celtic races.

BROOKE, SIR JAMES, Rajah of Sarawak, was born in Benares, India, April 29, 1803. In 1838, having gone to Borneo, he assisted the Sultan of Brunei (the nominal ruler of the island) in suppressing a revolt. For his services he was made Rajah and Governor of Sarawak, a district on the N. W. coast of the island, and, being established in the Government, he endeavored to induce the Dyak natives to abandon their irregular and piratical mode of life and to turn themselves to agriculture and commerce; and his efforts to introduce civilization were crowned with wonderful success. He was made a K. C. B. in 1847, and was appointed Governor of Labuan. He died in Devonshire, England, June 11, 1868.

BROOKE, RUPERT, an English poet and writer. He was born in Rugby in 1877, and was educated at Rugby School and at King's College, Cambridge. For several years he lived in Cambridge and devoted himself chiefly to the writing of poetry. His first volume was published in 1911 and was well received. He showed evidence of unusual talent and was considered one of the leaders of the new school of poetry. At the outbreak of the World War he enlisted, and while engaged in service was taken ill with blood poisoning. He died on April 23, 1915, on board a French hospital ship. A number of poems inspired by the war exhibit remarkable dramatic powers. His collected poems were published in 1915. Other works are "John Webster and Elizabethan Drama" (1916); "Letters from America" (1916); "Lithuania," a drama in one act (1916).

BROOKE, STOPFORD AUGUSTUS, an English Unitarian preacher, born in Donegal in 1832. He was educated at Trinity College, Dublin. He has held important curacies in London, and in 1872 was appointed Chaplain in Ordinary to the Queen. He subsequently became a Unitarian. He has published "Life and Letters of Frederick W. Robertson," "Theology in the English Poets," "Primer of English Literature," and "The Early Life of Jesus." "Treasury of Irish Poetry" (1901); "On ten Plays of Shakespeare" (1905); "Onward Cry" (1911); "Ten More Plays of Shakespeare" (1913). He died in 1916.

BROOK FARM ASSOCIATION, a community which originated in 1841, with William Henry Channing, George Ripley, and Sophia, his wife, with whom were united from time to time George William Curtis, Nathaniel Hawthorne, Theodore Parker, Charles Anderson Dana, John Sullivan Dwight, Margaret Fuller, and other personages of a philosophic turn of mind. It started as an expression of the transcendentalism then attracting philosophical minds in the region of Boston, and as a suggestion from the Fourier communistic movement in Europe. The dominating idea of the Brook Farm experiment was liberty; it was a practical protest against the long dominant Calvinism. An organization was formed, having those named and others as stockholders, and a farm of 200 acres was purchased in West Roxbury, 8 miles from Boston, where the Transcendentalists who adopted its main principle carried it into practice by working the land to the best of their ability and knowledge, which, however, were limited. That it ceased to exist, after five or six years, was due to the utterly unpractical natures of those engaged in the enterprise, which was finally abandoned after having been a financial failure from the beginning. The scheme of the association contemplated utilizing the labor—physically and intellectually—of each of its members, at a certain fixed rate, the intention being to dispose of the results of such labor to the outside public, and with such profit that all the delights and adornments of life were to be procurable therefrom, and were to be held in common by the members of the association. The whole undertaking was brought to a collapse by the destruction of the "Phalanstery" at Brook Farm, by fire, on the night of March 3, 1846.

BROOKLIME, the English name of a veronica or speedwell, *veronica beccabunga*. The flowers are generally bright

blue, but in one variety they are pink or flesh-colored. The plant is common in ditches and water-courses. It is sometimes used as a spring salad.

BROOKLINE, a town in Norfolk co., Mass.; on the Charles river, and the Boston and Albany and the New England railroads; 3 miles W. of Boston, with which it is connected by electric railroads. It contains the villages of Cottage Farm, Longwood, and Reservoir Station; has a granite town house, public library, and manufactories of electric motors, etc., and is chiefly a place of suburban residence, being one of the most beautiful and wealthy suburban towns in the country. Pop. (1910) 27,792; (1920) 37,748.

BROOKLYN, former city, since Jan. 1, 1898, one of the five boroughs of the city of Greater New York; situated on the W. extremity of Long Island, on New York Bay and the East river, which separates it from New York and connects Long Island Sound with New York Bay. Brooklyn is connected with New York by the Brooklyn, the Manhattan and the Williamsburg bridges and numerous ferries, and comprises Brooklyn proper, Williamsburg, Gravesend, Flatbush, Flat Lands, New Lots, New Utrecht, and several smaller suburban towns that were united with it prior to its consolidation with New York. It now extends from the Atlantic Ocean at Coney Island to the East river and New York harbor, and occupies the whole of Kings county; area 66.39 square miles; pop. (1900) 1,166,582; (1910) 1,643,351; (1920) 2,018,356.

The surface of the borough is generally elevated, sloping from the bay and river to a ridge which extends through the island. Its highest point is Mt. Pleasant, 194 feet above tidewater. Its water front extends from Newtown creek, emptying into the East river, to beyond Sheepshead Bay. The shore opposite lower New York is an irregular bluff, with an elevation of about 90 feet, and is known as Brooklyn Heights, while South Brooklyn is low. Brooklyn, being an aggregation of separate towns and villages, presents a very irregular street system and lacks unity of design. The main business street is Fulton street, from Fulton Ferry to East New York, and contains some of the largest retail establishments in the United States. Clinton avenue is the handsomest street in the city, and is lined with fine residences surrounded by ornamental grounds and shade trees.

There is an excellent water system and the average daily consumption is 170,-

000,000 gallons. The borough has 892 miles of paved streets and 375 miles of unpaved streets open to traffic. Various electric street railroads and steam and electric elevated roads connect Brooklyn with its suburbs, and by means of four bridges with Manhattan Borough.

There are 55 parks, playgrounds and open spaces in Brooklyn, with an area of 1,153 acres. Prospect Park is the largest, with 526 acres, including 77 acres of lakes and waterways, 70 acres of meadows, 110 acres of woodland, and 259 of plantations. It is situated on an elevated ridge and commands a magnificent view of the ocean, the Sound, Long Island, New Jersey, and New York City. It has been left to a great extent in its original wooded condition, making it one of the most picturesque parks in the United States. There is a Soldiers and Sailors' Memorial Arch and a statue of President Lincoln at the Flatbush avenue entrance. Of the other parks, Washington Park, the site of extensive Revolutionary fortifications, of which Fort Greene is the principal one, is the largest. Among the smaller parks are the City Park, Carroll Park, Tompkins Park, Seaside Park, and Highland Park.

The principal public buildings of Brooklyn are grouped together about the Borough Hall. This building is of white marble in the Ionic style. The Kings County Court House stands just E. of the Borough Hall, and has a marble front with a Corinthian portico and an iron dome over 100 feet high. Near the Court House are the Municipal Building and the Hall of Records, both of marble. The Federal Building is the finest structure in the borough, built of granite at a cost of \$5,000,000. It is in the Romanesque style, with numerous turrets and a tall tower. It was opened in 1892 and is occupied by the postoffice and the United States courts. Other notable buildings are the Academy of Music, the Brooklyn Bank, Pratt Institute, the Brooklyn Library, the Art Association Building, and the Brooklyn Polytechnic Institute. The most notable and important navy yard in the United States is located here.

In 1918-1919 Brooklyn had 8,281 factories, employing a total of 185,625 people, an increase in 10 years of over 3,000 factories and 40,000 employees. The principal articles of manufacture are: Machinery and metal products, clothing, textiles, boots, shoes, furs, chemicals, drugs, paints, colors, paper goods, books, wood products, instruments, electrical appliances, confectionery, foods, tobacco, flax, hemp, jute products, rubber and leather goods.

Brooklyn has a water front of 200

miles, and when the Jamaica Bay improvement is carried out will have 150 more. Over \$200,000,000 has been spent in the development of its shore line. It is estimated that more than half the foreign commerce of New York City is carried on from the Brooklyn docks. The steamship piers alone represent an investment of over \$100,000,000. More than 40 steamship lines with a fleet of 700 ships leave and enter Brooklyn docks. One inlet from the East river alone, although only four miles in length, carries more commerce annually than that floated on the entire Mississippi river.

There were in 1919 6 National banks with 2 branches, 6 State banks with 14 branches, 6 trust companies with 16 branches, 22 savings banks, and 20 private banks with capital, surplus, and undivided profits of over \$90,000,000 and representing resources of \$1,000,000,000.

In addition to these institutions, there are 7 title and mortgage guarantee companies with home or branch offices in the city that have assets of over \$100,000,000, a capital of \$13,000,000, and a surplus of \$29,000,000. Savings bank deposits are \$423,363,418. There are 695,000 depositors with an average account of \$609.

In 1919 there were 347,313 registered pupils in the public schools. The public school system includes a Training-school for Teachers, Girls' High School, Boys' High School, Manual High School, and Truant School. For higher education are the Polytechnic Institute for boys; the Packer Institute for girls; Pratt Institute (coeducational); the Brooklyn College of Pharmacy, and the Brooklyn Institute.

Brooklyn has been widely known as the City of Churches. There are now nearly 575 of such edifices and chapels, with a membership of 782,422. The Roman Catholic Church is the strongest denomination. Then follow the Methodist Episcopal, Protestant Episcopal, Baptist, Lutheran, Presbyterian, Congregational, Reformed, synagogues, and others of various denominations.

The most important hospitals in Brooklyn are the Long Island College, Brooklyn, Brooklyn Homeopathic, General, St. Mary's, Methodist, St. John's, and St. Peter's. The public institutions are mostly at Flatbush, and include the insane asylum, hospital, and almshouse.

The assessed valuation in 1920 was \$1,865,123,952. The tax rate was 2.36.

Brooklyn was settled by the Dutch in 1636 at New Utrecht. In 1646 five small towns consolidated under the name of Breuckelen, from the Dutch town whence most of the settlers came. In

1666 the first Dutch church was built in Breuckelen. About this time the English came into possession of New York and Long Island, and Breuckelen became a part of West Riding. On Aug. 27, 1776, the battle of Long Island was fought in Brooklyn, and the village was held by the British till 1783. Brooklyn was incorporated as a village in 1816; slavery was abolished there in 1825, and in 1834 it became a city. Several adjoining towns were annexed from time to time, and in 1896 Brooklyn comprised all of Kings co. On Jan. 1, 1898, Brooklyn was consolidated with Greater New York, under the name of the Borough of Brooklyn.

BROOKS, CHARLES WILLIAM SHIRLEY, editor of "Punch," was born in London, April 29, 1816. From clerk he became a reporter, and settling in London, wrote dramas, contributed to some of the leading periodicals and journals, and in 1853 was sent by the "Morning Chronicle" to study labor conditions in Russia, Syria and Egypt. His observations were published in "Russians of the South" (1856). In 1854 he joined the staff of the London "Punch." In 1870 he succeeded Mark Lemon as its editor. His novels include "Aspen Court"; "The Gordian Knot"; "The Silver Cord"; "Sooner or Later." He also wrote "Amusing Poetry" (1857). He died in London, Feb. 23, 1874.

BROOKS, NOAH, an American journalist and author, born in Castine, Me., Oct. 30, 1830. He was connected with newspapers in Massachusetts, California, Washington, and New York. He wrote many popular books for boys, among which are: "The Fairport Nine" (1880); "Our Baseball Club" (1884); "How the Republic is Governed." He edited and enlarged Bryant and Gay's "History of the United States." He died in Pasadena, Cal., Aug. 16, 1903.

BROOKS, PHILLIPS, an American clergyman of the Episcopal Church, born in Boston, Dec. 13, 1835. He was rector of Protestant Episcopal churches successively in Philadelphia and in Boston, and was made Bishop of Massachusetts in 1891. He was an impressive pulpit orator. He wrote "Letters of Travel"; "Lectures on Preaching" (1887); and "Essays and Addresses" (1894). He died in Boston, Jan. 23, 1893.

BROOKS, PRESTON SMITH, an American legislator, born in Edgefield, S. C., Aug. 14, 1819. He served in the Mexican War; was elected to Congress in 1853, and on May 22, 1856, he as-

saulted Senator Charles Sumner in the Senate Chamber, beating him into insensibility with a cane. He afterward resigned, but was immediately returned to the House by his District. He died in Washington, D. C., Jan. 27, 1857.

BROOM, the English name of the common shrub, *sarothamnus*, formerly *cytisus scoparius*, and of the genus to which it belongs. It has large beautiful yellow flowers. Butchers' broom is the English name for the liliaceous genus *ruscus*, and especially for the *ruscus aculeatus*. Irish broom is the *sarothamnus patens*, a native of Spain and Portugal. The word is also applied to a besom for sweeping.

BROOM CORN, a name for two plants of the order *grammaceæ* (grasses): (1) *Sorghum vulgare*. Its panicles are made into brooms for sweeping and into clothes brushes. (2) *Sorghum saccharatum*, of which a species of molasses or syrup is made.

BROOM RAPE, the English name of *orobanche*, a genus of plants constituting the typical one of the order *orobanchaceæ* (broom rapes). All are parasitic on other plants. They grow upon furze, broom, a galium, on thymus, a centaurea, a picris, on clover, milfoil, on hemp roots, etc. Some broom rapes confine themselves to a single genus or even species of plants, while others range over a considerable variety. The greater broom rape, one of the eleven which grows on leguminous plants, especially on furze, broom, and clover, is so destructive to the last named genus of plants in Flanders that it prevents many farmers from attempting their cultivation. The tall broom rape (*orobanche elatior*), though preferring *centaurea scabiosa*, also attacks clover, as does the lesser broom rape (*orobanche minor*).

BROOM TOPS, the fresh and dried tops of *cytisus scoparius* (common broom). There are two officinal preparations; the decoction (*decoctum scoparii*), consisting of a pint of distilled water to an ounce of the dried tops, and the juice (*succus scoparii*), made of three ounces of the fresh expressed juice to a pint of rectified spirits. They are valuable diuretics, especially in cardiac dropsies. Scoparine and sparteia are the two active principles; the action of sparteia is analogous to that of conia.

BROSE (Gaelic *brothas*), a dish sometimes used in Scotland, made by pouring boiling water, milk, or the liquor in which meat has been boiled, on oatmeal, and mixing the ingredients by imme-

diate stirring. Butter may be added, and sweet milk when the brose is made with water. It is kail brose, water brose, or beef brose, according to the liquid used. Athole brose, a famous Highland cordial, is a compound of honey and whiskey.

BROTHERHOODS, RELIGIOUS, were societies instituted for pious and benevolent purposes, and were numerous in the Middle Ages. Such brotherhoods or confraternities, were, in earlier times, those of Mary, of the Scapular, and of the Rosary; in later times, that of the Sacred and Immaculate Heart of Mary, for the conversion of sinners, that of Francis Xavier, or the Mission Brotherhood, and that of Christian Learning (*Frères Ignorantins*) for the education of the people. The bridge-building brotherhood (*Fratres Pontifices*) originated in southern France toward the end of the 12th century, and was recognized by Pope Clement in 1189. Their occupation was to keep up hospices at the most frequented fords of great rivers, maintain ferries and build bridges. Other brotherhoods were the Familiars and Crossbearers of the Inquisition in Spain, and the *Fratres Calendarii* in north Germany and the Netherlands. The great Brotherhood of Common Life was founded about 1376 by Geert Groote (born 1340; died 1384) and Florentius Radewin (born 1350; died 1400) at Deventer. Its members were sometimes styled Brethren of Good Will, also Hieronymites and Gregorians, from Hieronymus and Gregory the Great, whom they claimed as patrons. Community of goods, ascetic habits, industry, and the use of the vernacular language in divine service, were some of the chief points insisted on by the brethren, who were not fettered by monastic or any other vows. Their principal occupations were the copying of the Bible and other books for the common purse, prayer and the instruction of the young, and their services in the last direction can hardly be overestimated. Their most famous houses were those of Windesheim, near Deventer, and Agnetenberg, near Zwolle. They became numerous in the Netherlands and north Germany, but also spread themselves in Italy, Sicily, and Portugal, so that in 1430 they reckoned more than 130 societies. The last was founded in Cambrai in 1505. The most important and distinguished members of the society were Gerhard Zerbald of Zutphen, the famous Thomas à Kempis, and the learned Cardinal Nicholas Cusa. Female societies of a similar character sprung up at the same time with those of the Brothers of Common Life. Even

within the Protestant Churches, single brotherhoods have been formed, as the Rauhes Haus, founded by Wichern at Hamburg in 1833. Several similar institutions for women exist within the Church of England. See SISTERHOODS.

BROTHERS, a name given to three isolated mountains near the coast of New South Wales, between Harrington Inlet to the S. and Port Macquarie to the N. They are valuable as landmarks. The name is also common to several groups of small islands.

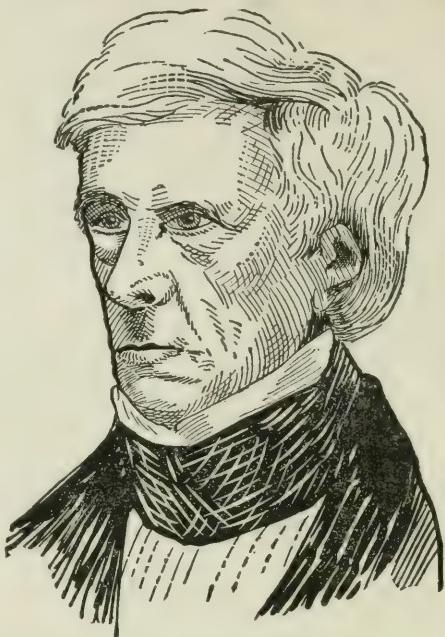
BROTHERS, a term applied to the members of monastic and military orders, as being united in one family. Lay brothers were an inferior class of monks employed in monasteries as servants. Though not in holy orders, they were bound by monastic rules.

BROTHERS OF THE CHRISTIAN SCHOOLS, a Roman Catholic Order formed by the Abbé La Salle at Rheims, and confirmed by Benedict XIII. in 1725. Its members are not allowed to enter the priesthood, but devote themselves to teaching the poor. There are branches of the Order in the United States as well as in most European countries.

BROUGHAM, named after Lord Brougham, a four-wheeled closed carriage with a single inside seat for two persons, or a similar carriage with two seats, each accommodating two persons. The seat for the driver is elevated.

BROUGHAM, HENRY PETER (brö'-am or bröm), **LORD BROUGHAM AND VAUX**, a British statesman, orator, and author, born in Edinburgh, Sept. 19, 1778; entered the University of Edinburgh in 1792. In 1802 he helped to found the "Edinburgh Review," and was one of the chief contributors. His article on Byron's "Hours of Idleness" provoked the poet to write his "English Bards and Scotch Reviewers." In 1810 Brougham entered Parliament, where his remarkable eloquence gave him at once a commanding place. He was counsel for Queen Caroline in George IV.'s suit against her (1820), winning a decisive victory. He became Lord Chancellor in 1830, and was at the same time created a baron; he resigned on the defeat of the Whigs in 1834, and never again held public office. His later years were passed partly in England, and partly at Cannes. He was the steadfast and powerful champion of revision and reform of the laws, popular education, the abolition of slavery, and the maintenance of peace. The famous Reform Bill of 1832 was carried largely by his agency. His miscellaneous writings in

their collected edition (11 vols., 1855-1861) cover a vast number and variety of subjects. His best works are his



LORD BROUGHAM

"Sketches of the Statesmen of the Time of George III." and "Lives of Men of Letters and Science." He died in Cannes, France, May 7, 1868.

BROUGHAM, JOHN, an American actor and playwright, born in Dublin, Ireland, May 9, 1810; made his début as an actor in England in 1830. He came to the United States in 1842, and, with the exception of a short return trip to England in 1860, remained here until his death. He was the author of over 100 comedies, farces, and burlesques. Among his most successful plays were "Vanity Fair," "The Irish Emigrant," "The Game of Love," and "London Assurance," written in collaboration with Dion Boucicault. He was also author of sketches entitled "Basket of Chips" (1855) and "Bunsby Papers." He died in New York, June 7, 1880.

BROUGHTON, RHODA, an English novelist, born in Segrwyd Hall, Denbighshire, Wales, Nov. 29, 1840. She was the daughter of a clergyman, and resided at Broughton Hall, Cheshire. Her novels are very popular, and include "Cometh Up as a Flower" (1867); "Not Wisely but Too Well" (1867); "Red as a Rose Is She" (1870); "Good-bye, Sweetheart" (1872); "Nancy" (1873); "Belinda"

(1883); "Doctor Cupid" (1886); "Alas" (1890); "A Beginner" (1894); "Scylla and Charybdis" (1895); "Between Two Stools" (1912), etc. She died in 1920.

BROUSSA (brō'sa), **BRUSA**, or **BOURSA**, the ancient Prusa, where the Kings of Bithynia usually resided, situated in Asiatic Turkey, at the foot of Mount Olympus, in Asia Minor, 13 miles S. of the Sea of Marmora. Broussa is pleasantly situated, facing a beautiful and luxuriant plain. It contains about 200 mosques, some of which are very fine buildings, also three Greek churches, an Armenian, and several synagogues. The population of Broussa is about 71,000.

BROUSSARD, ROBERT F., an American senator; born in New Iberia, La., Aug. 17, 1864. He studied at Georgetown University, Washington, D. C., and graduated from the law school of Tulane University of Louisiana, in 1889. He served for eighteen years as representative in Congress from the Fifty-fifth to the Sixty-third Congresses inclusive. He was elected to the United States Senate in May, 1912, for the term beginning March 4, 1915. He died April 12, 1918.

BROUSSONETIA (named after P. N. V. Broussonet, a naturalist who traveled in Barbary, and published a work on fishes in 1782), a genus of plants belonging to the order *urticaceæ* (nettlesworts). *B. papyrifera* is the paper mulberry. It has 3-5 lobed leaves. There is another species of the genus, *B. spatulata*, or entire leaved broussonetia.

BROWN. Brown is not one of the primary colors in a spectrum. It is composed of red and yellow, with black, the negation of color. It is also the name of a genus of colors, of which the typical species is ordinary brown, tinged with grayish or blackish. The other species are chestnut brown, deep brown, bright brown, rusty, cinnamon, red brown, rufous, glandaceous, liver colored, sooty, and lurid.

BROWN, BENJAMIN GRATZ, an American politician, born in Lexington, Ky., May 28, 1826; graduated at Yale, in 1847. He practiced law in Missouri, and was a member of the State Legislature in 1852-1858. In the Civil War he served in the Union army, recruiting a regiment, and becoming a Brigadier-General of volunteers. In 1863-1867 he was United States Senator from Missouri, and in 1871 was elected governor of his State. He was the candidate for the Vice-Presidency of the United States on the ticket with Horace Greeley in 1872. He died in St. Louis, Dec. 13, 1885.

BROWN, CHARLES BROCKDEN, an American novelist, born in Philadelphia, Jan. 17, 1771, was of a highly respectable family, of Quaker descent. He studied law, but abandoned it for literature. His first publication was "Alcuin, a Dialogue on the Rights of Women," which appeared in 1797; followed in 1798 by "Wieland; or, the Transformation," a novel; and in 1799 by "Ormond; or, the Secret Witness." In 1798 he established himself in New York, and when the yellow fever broke out there he refused to forsake his friends and neighbors; and was himself attacked by the pestilence. His experiences he developed in "Arthur Mervyn; or, Memoirs of the Year 1793." "Edgar Huntly; or, the Adventures of a Sleep-Walker." The second part of "Arthur Mervyn" appeared in 1800; and "Clara Howard" in 1801; and in 1804 the series of his romances was closed with "Jane Talbot." In 1801 he returned to Philadelphia, and edited the "Literary Magazine and American Register." He projected the plan of an "Annual Register," the first work of the kind in the United States, and edited the first volume of it in 1806. He died Feb. 22, 1810.

BROWN, FORD MADDOX, an English artist, born in Calais, France, in 1821. In 1835 was placed in the Academy at Bruges, studied also at Ghent and Antwerp, and later in Paris. Settled in London in 1845-1846. He was associated with Rossetti, Millais, and the rest of the pre-Raphaelite brotherhood. Among his best pictures are "Lear and His Daughters," "Farewell to England," and "Work," an aggregation of pictures illustrating labor. He died in London, Oct. 6, 1893.

BROWN, GOOLD, an American grammarian, born in Providence, R. I., March 7, 1791. He is known as the author of "Brown's Grammar," a school text book widely used for some generations, and still in circulation. He published "First Lines of English Grammar" (1823); "Grammar of English Grammars" (1850-1851), etc. He taught an academy in New York City for 20 years. He died in Lynn, Mass., March 31, 1857.

BROWN, HENRY KIRKE an American sculptor, born in Leyden, Mass., Feb. 24, 1814. He made the equestrian statue of Washington in Union Square, New York, the altar piece for the Church of the Annunciation in the same city, portrait busts of William Cullen Bryant, Dr. Willard Parker, Erastus Corning, and other New York men, and the statue of De Witt Clinton in Greenwood cemetery. The last named was the

first bronze statue cast in the United States. Some of his other well known works are a statue of Lincoln in Prospect Park, Brooklyn, and equestrian statues of Gen. Scott and Nathanael Greene for the National Government, etc. He died in Newburgh, N. Y., July 10, 1886.

BROWN, JACOB, an American army officer, born in Bucks co., Pa., May 9, 1775. He was a commander on the Canadian frontier in the War of 1812. In the engagements at Fort Erie he so distinguished himself as to receive the thanks of Congress, Nov. 13, 1814. The city of New York also voted him its freedom. At the close of the war he was in command of the Northern Division of the army, and, in March, 1821, became general-in-chief of the United States army. He died in Washington, D. C., Feb. 24, 1828.

BROWN, JOHN, author of the Brunonian system in medicine, born in Berwickshire, Scotland, in 1735. After studying medicine at the Edinburgh University he took the degree of Doctor in Medicine at St. Andrew's, and, after practicing and teaching in Edinburgh, he published his "Elements of Medicine" (in Latin). He maintained that the majority of diseases were proofs of weakness and not of excessive strength, and that bleeding was erroneous. His opinions materially influenced the practice of his professional successors. He removed to London in 1786, and died there, Oct. 17, 1788.

BROWN, JOHN, an American opponent of slavery, born in Torrington, Conn., May 9, 1800. He early conceived a hatred for slavery, and, having removed to Osawatomie, Kan., in 1855, he took an active part against the pro-slavery party. In the summer of 1859 he rented a farmhouse about 6 miles from Harper's Ferry, and organized a plot to liberate the slaves of Virginia. On Oct. 16, he, with the aid of about 20 friends, surprised and captured the arsenal at Harper's Ferry, but was wounded and taken prisoner by the Virginia militia next day; and was tried and executed at Charlestown, Dec. 2, 1859.

BROWN, JOHN, a Scotch physician and essayist, born in Biggar in 1810. He graduated in 1833 and began practice as a physician. His leisure hours were devoted to literature. His collected writings were published under the title of "Hortæ Subsecivæ" and embrace papers bearing on medicine, art, poetry, and

human life generally. "Rab and His Friends," "Our Dogs," "Pet Marjory," "Jeems the Doorkeeper" on which his fame chiefly rests, have been published separately. He died in Edinburgh, in 1882.



JOHN BROWN, ABOLITIONIST

BROWN, NICHOLAS, an American merchant, born in Providence, R. I., April 4, 1769; best known as the chief patron of Brown University. In honor of his gifts, which exceeded \$100,000, the name of the institution was changed, in 1804, from Rhode Island College to Brown University. He gave also magnificent sums to other public institutions of Providence. He died Oct. 27, 1841.

BROWN (or BROWNE), ROBERT, founder of an English religious sect first called Brownists, and afterward Independents, was born about 1540, and studied at Cambridge, where, in 1580, he began openly to attack the government and liturgy of the Church of England as anti-Christian. He was excommunicated, but was reinstated, and held a church living for over 40 years, dying in 1633. The sect of Brownists soon spread, and a bill was brought into Parliament which inflicted on them very severe pains and penalties. In process of time, the Brownists merged into Congregationalists.

BROWN, ROBERT, a Scotch botanist, born in Montrose, Dec. 21, 1773; received his education at Marischal College, Aberdeen, and afterward studied medicine at Edinburgh. In 1800 he was appointed naturalist to Flinders' surveying expedition to Australia. He returned with nearly 4,000 species of plants, and was shortly after appointed librarian to the Linnaean Society. In 1810 he published the first volume of his great work, "Prodromus Floræ Novæ Hollandæ et Insulæ Van Diemen." He was the first English writer on botany who adopted the natural system of classification, which has since entirely superseded that of Linnaeus. In 1814 he published a botanical appendix to Flinders' account of his voyage, and in 1828 "A Brief Account of Microscopical Observations on the Particles Contained in the Pollen of Plants, and on the General Existence of Active Molecules in Organic and Inorganic Bodies." He also wrote botanical appendices for the voyages of Ross and Parry, the African exploration of Denham and Claperton, and others. In 1810 he received the charge of the collections and library of Sir Joseph Banks. He transferred them in 1827 to the British Museum, and was appointed keeper of botany in that institution. He became a Fellow of the Royal Society in 1811, D. C. L., Oxford, in 1832, a Foreign Associate of the French Academy of Sciences in 1833. President of the Linnaean Society in 1849. He died in London, June 10, 1858. As a naturalist Brown occupied the very highest rank among men of science.

BROWNE, CHARLES FARRAR, an American humorist, best known as ARTEMUS WARD, born at Waterford, Me., April 26, 1834. Originally a printer, he became editor of papers in Ohio, where his humorous letters became very popular. He subsequently lectured on California and Utah, and in England, where he contributed to "Punch." He died in Southampton, England, March 6, 1867.

BROWNE, HABLOT KNIGHT, an English artist (pseudonym PHIZ); best known as the illustrator of Dickens' works, beginning with "Pickwick" in 1836; born June 15, 1815; died July 8, 1882.

BROWNE, JUNIUS HENRI, an American journalist, born in Seneca Falls, N. Y., in 1833. He resided in New York City. Among his works are "Four Years in Secession" (1865); "The Great Metropolis, a Mirror of New York" (1869); "Sights and Sensations in Europe" (1872). He died in 1902.

BROWNE, SIR THOMAS, an English antiquary and physician, born in London in 1605. After receiving an academic and a professional education in England, he visited the Continent and took the degree of M. D. at Leyden. He was knighted by Charles II. His principal work is "Religio Medici" (1642), a liberal confession of faith for that day. "Vulgar Errors," was directed against the current superstitions of his contemporaries. "Urn Burial" appeared in 1658. He died in 1682.

BROWNE, WILLIAM, an English poet, born in Tavistock, Devonshire, in 1591; was educated at Oxford. His poetry is graceful and fanciful, and abounds in beautiful pictures of English scenery. His chief work is "Britannia's Pastorals" (1613-1616). "The Shepherd's Pipe" (1614). "The Inner Temple Masque" (1614-1615) tells the story of Ulysses and Circe. His minor poems are very fine. He died in Ottery St. Mary about 1643.



ELIZABETH BARRETT BROWNING

BROWNELL, WILLIAM CRARY, an American essayist and critic, born in New York City, Aug. 30, 1851. He graduated from Amherst, and devoted himself to critical and editorial work in New York. He became editor of "Scribner's Magazine," and wrote "French Traits: an Essay on Comparative Criticism" (1889); "French Art" (1892); "Newport" (1896); "American Prose Masters" (1909); and "Criticism" (1914).

BROWNING, ELIZABETH BARRETT, an English poet, born in Durham, March 6, 1809. In September, 1846, she married Robert Browning. Her chief poems are "The Seraphim" (1838); "Romant of the Page" (1839); "The Drama of Exile" (1844); "A Vision of Poets" (1844); "The Cry of the Children" (1844); "Casa Guidi Windows" (1851); "Aurora Leigh" (1856). Her "Sonnets from the Portuguese" are among the noblest of love poems. The "Romance of the Swan's Nest," the "Rhyme of the Duchess May," the "Romant of Margret," "Bertha in the Lane," and "Isabel's Child," are romantic and original ballads. "Prometheus Bound," a metrical translation of *Æschylus*, was published in 1850. She died in Florence, June 30, 1861.

BROWNING, ROBERT, an English poet, born in Camberwell, May 7, 1812. His first dramatic poem, "Pauline," which appeared anonymously in 1833, was followed two years later by "Paracelsus," "Strafford" (1837); "Sordello"



ROBERT BROWNING

(1840), and a series of plays and dramatic lyrics under the title of "Bells and Pomegranates" (1841-1846). In 1846 he married Elizabeth Barrett, and resided in Florence until her death in 1861,

when he returned to London. "The Ring and the Book" was published in 1869. His other works include "Christmas Eve and Easter Day" (1850); "Men and Women" (1855); "Dramatis Personæ" (1864); "Balaustion's Adventure" (1871); "Fifine at the Fair" (1872); "Red-Cotton Nightcap Country" (1873); "Dramatic Idylls" (1875-1880); "Jocoseria" (1883); "Ferishtah's Fancies" (1884); and "Parleyings with Certain People of Importance in their Day" (1887). He died in Venice, Dec. 12, 1889.

BROWN-SÉQUARD (-sä-kär), ÉDOUARD, a Franco-American physiologist and physician, was born in Mauritius in 1818, his father being a sea-captain from Philadelphia, who married on the island a lady named Séquard. The son studied in Paris, and graduated M. D. in 1846. He devoted himself mainly to physiological research, and received numerous prizes, French and British, for the results of valuable experiments on blood, muscular irritability, animal heat, the spinal cord, and the nervous system. In 1864 he became Professor of Physiology at Harvard, but in 1869 returned to Spain as Professor of Pathology in the School of Medicine. In 1878 he succeeded Claude Bernard as Professor of Experimental Medicine at the Collège de France. His publications include lectures on "Physiology and Pathology of the Nervous System" (Philadelphia, 1860); on "Paralysis of the Lower Extremities" (1860); and on "Nervous Affections" (1873). He died in Paris, April 1, 1894.

BROWNSVILLE, city, port of entry, and county-seat of Cameron co., Tex.; on the Rio Grande and the Rio Grande and St. Louis, Brownsville and Mexican railroads, opposite Matamoras, Mexico. It contains the Cathedral of the Immaculate Conception, the Convent and Academy of the Incarnate Word, a United States Government building, and National banks; and has a large trade with Mexico. In the suburbs is Fort Brown, a garrisoned United States post. In May, 1846, Brownsville was occupied and fortified by a small body of United States troops, who maintained their position in the face of a heavy bombardment that lasted for 160 hours; and in November, 1863, it was taken from the Confederates by a Federal army under General Banks. Pop. (1910) 10,517; (1920) 11,791.

BROWN-TAILED MOTH, *Euproctis chrysorrhœa*, a European moth of the *Liparididae* family, having white wings and a brown rump, the larvæ feeding on forest and orchard trees. It appeared

in Massachusetts some few years ago, shortly after the arrival of the gipsy moth, and has already become a serious pest in that State. It is thought to have been introduced from Holland in a consignment of roses. More than \$1,000,000 has already been spent by the State of Massachusetts in endeavoring to destroy this and the gipsy moth; and although great success was at first obtained in this direction, the cessation of attempts at extermination through the grant of funds being discontinued led to the reappearance of the moths in greater numbers than ever. A four-winged fly, which acts as a parasite, depositing its eggs in the larvæ, has now been brought from Europe, resulting in large numbers of the caterpillars being killed.

BROWN UNIVERSITY, an institution for higher education at Providence, R. I.; founded in 1764. It was at first known as Rhode Island College, but in honor of Nicholas Brown, a wealthy merchant who endowed it generously, the name was changed to Brown in 1804. In 1919 its enrolment included 277 freshmen, 220 sophomores, 174 juniors and 182 seniors. There were 79 students pursuing special courses and 106 graduate students. There were 270 in the women's college. The teaching staff included 78 full professors, besides a staff of assistant teachers. The volumes in the library number 270,000. A Memorial Arch and a Language Building were erected in 1919. Language requirements for entrance have been modified and an increase made in the number of elective courses. President, W. H. P. Faunce, DD., LL. D.

BRUCE, a family name distinguished in the history of Scotland.

BRUCE, JAMES, an African traveler, born in Kinnaird, Dec. 14, 1730. He received his education at Harrow and at the University of Edinburgh, and entered the wine trade, but having inherited his father's estate in 1758, he soon gave up business. From 1763 to 1765 he held the consulship of Algiers, and in 1765 he visited successively Tunis, Tripoli, Rhodes, Cyprus, Syria, and several parts of Asia Minor, where he made drawings of the ruins of Palmyra, Baalbec, etc. In 1768, he set out for Cairo, navigated the Nile to Syene, crossed the desert to the Red Sea, passed some months in Arabia Felix, reached Gondar, the capital of Abyssinia, in 1770, and in the same year succeeded in reaching the sources of the Abai, then considered the main stream of the Nile. After visiting France and Italy, he returned to Scotland in 1774. His long-expected "Travels"

did not appear until 1790. Bruce lost his life by an accident, April 27, 1794.

BRUCE, MICHAEL, a Scottish poet, born in Kinnesswood, Kinross-shire, March 27, 1746. At first a herd-boy, he succeeded in attending Edinburgh University, occupying himself in the intervals as a village schoolmaster. His poems, of which the best known is the "Elegy," on his own approaching death, were published by the Rev. John Logan, in 1770. He died July 5, 1767.

BRUCE, ROBERT, Earl of Carrick, accompanied Edward I. to Palestine in 1269; married, in 1271, Martha Margaret, Countess of Carrick. Like his father, he resigned the Lordship of Annandale to his eldest son to avoid acknowledging the supremacy of Baliol. On the revolt of the latter Bruce fought on the English side, and after the battle of Dunbar made an unsuccessful application to Edward for the crown. He died in 1304.

BRUCE, ROBERT, the greatest of the Kings of Scotland, born in 1274. He was the son of the preceding. In 1296, as Earl of Carrick, he swore fealty to Edward I., and in 1297 fought on the English side against Wallace. He then joined the Scottish army, but in the same year returned to his allegiance to Edward until 1298, when he again joined the National party, and became in 1299 one of the four regents of the kingdom. In the three final campaigns, however, he resumed fidelity to Edward, and resided for some time at his court; but, learning that the King meditated putting him to death on information given by the traitor Comyn, he fled, in February, 1306, to Scotland, stabbed Comyn in a quarrel at Dumfries, assembled his vassals at Lochmaben Castle, and claimed the crown, which he received at Scone, March 27. Being twice defeated, he dismissed his troops, retired to Rathlin Island, and was supposed to be dead, when, in the spring of 1307, he landed on the Carrick coast, defeated the Earl of Pembroke at Loudon Hill, and in two years had wrested nearly the whole country from the English. He then in successive years advanced into England, laying waste the country, and on June 24, 1314, defeated at Bannockburn the English forces advancing under Edward II. to the relief of the garrison at Stirling. In 1316 he went to Ireland to the aid of his brother Edward, and, on his return in 1318, in retaliation for inroads made during his absence, he took Berwick and harried Northumberland and Yorkshire. Hostilities continued until the defeat of Edward near Byland Abbey in 1323, and though in that year a truce was concluded for 13 years, it

was speedily broken. Not until March 4, 1328, was the treaty concluded by which the independence of Scotland was fully recognized. Bruce did not long survive the completion of his work, dying at Cardross Castle on June 7, 1329. He was twice married; first to a daughter of the Earl of Mar, Isabella, by whom he had a daughter, Marjory, mother of Robert II., and then to a daughter of Aymer de Burgh, Earl of Ulster, Elizabeth, by whom he had a son, David, who succeeded him.

BRUCE, THOMAS, Earl of Elgin and Kincardine, an English diplomatist and antiquary, born July 27, 1766. He was successively Envoy at Brussels, Berlin, and Constantinople, and made a valuable collection of ancient sculptures at Athens, which was purchased by Parliament for the British Museum in 1816, and is known as the Elgin Marbles. He died in Paris, Nov. 14, 1841.

BRUCEA, a genus of plants belonging to the order *xanthoxylaceæ* (*xanthoxyls*). The green parts of *B. sumatrana* are intensely bitter. *B. antidysenterica* contains a poisonous principle called brucia. The bark of another species is bitter, and has qualities like those of *quassia simarouba*. *B. ferruginea* is from Abyssinia.

BRUCHSAL (bröch'sal), a town of Baden, 25 miles S. of Heidelberg. It was the residence of the prince-bishops of Spires from the 11th century, but lost its importance until it became a considerable railway center. The Grand-Duke of Baden has a fine palace here. Pop. about 15,000.

BRUCHUS, a genus of beetles belonging to the section *tetramera*, and the family *rhyncophora* or *curculionidæ*. The antennæ are 14-jointed, and are filiform, serrate or pectinated, not geniculated as in the more normal *curculionidæ*. It contains small beetles which deposit their larvæ in the germs of leguminous plants, and, when hatched, devour their seed. *B. pisi* is destructive to the garden pea.

BRUCINE, or BRUCIA (named from the plant *B. antidysenterica*, from which it is derived), an alkaloid found along with strychnine in *nux vomica*; also in false Angostura bark.

BRUGES, a city of Belgium, capital of West Flanders, at the junction of the canals from Ghent, Ostend, and L'Ecluse, 7 miles from the North Sea, and 60 miles N. W. of Brussels; lat. $51^{\circ} 12' 30''$ N., long. $3^{\circ} 13' 44''$ E. The city has a circumference of nearly $4\frac{1}{2}$ miles, and is entered by six gates. Many large and

noble ancient mansions and spacious public edifices present their pointed gables to the streets, and afford interesting specimens of the ornamental Gothic architecture of the Middle Ages. Among the most remarkable public edifices are the Cathedral of Notre Dame (Onser Vrouw), the old Gothic Hospital of St. John, and the elegant church of St. Saviour. In the great square is a lofty Gothic tower or belfry, the most beautiful in Europe, and its chimes are harmonious. In this tower there are 48 bells, some



THE BELFRY OF BRUGES

weighing six tons; they are played upon every quarter of an hour by means of an immense copper cylinder communicating with the clock, and weighing about nine tons. Its surface is pierced by 30,500 square holes, so that an infinite variety of airs may be set upon it, by merely shifting the iron pegs that lift the hammers. The Ostend canal presents an expanse of surface that resembles a stately river. There are many bridges across the numerous canals, by which the streets are intersected; hence, the Flemish name of the place—Brügge, that is, bridges; in French, Bruges. The chief manufactures before the World War were woolens, linens, cottons, lace, dye works, sugar refineries and ship building yards. The lace manufacture is the most important. From the 7th century Bruges was rapidly acquiring importance. During the government of the rich and

powerful Counts of Flanders, who resided there from the 9th to the 15th centuries, its woolen manufactures grew and flourished to an amazing extent. Under the Austrian dynasty, at the close of the 15th century, the rebellious conduct of the inhabitants of Bruges called upon it such destructive vengeance that henceforth its greatness died away, its trade was transferred to Antwerp, and the religious persecution and ferocity of the Spanish under Philip II. and the Duke of Alva completed the process of its ruin. Early in 1904, a new canal was inaugurated, extending from Zeebrugge, a port on the North Sea, 14.29 miles N. of Ostend, to the city, a distance of 7.49 miles. Pop. about 54,000. In the World War (1914-1918) the Germans occupied Bruges in the fall of 1914 and held it to the close of the conflict. With Zeebrugge it became a submarine base for attacks on British channel shipping. In the bombardment of the city by the Germans in 1915 many famous buildings were damaged or destroyed. These included the Hôtel de Ville, Les Halles, with a famous belfry, and the ancient Hospital of St. John, erected in the 12th century.

BRUGG, a town in the Swiss canton of Aargau, on the right bank of the Aar, and near the mouth of the Reuss, 36 miles E. S. E. of Basel by rail. Near it is the site of Vindonissa, the chief Roman station in Helvetia; and it was also the cradle of the house of Hapsburg, whose ruined castle, founded in 1020, crowns a wooded height 2 miles from the village. Nearer is the abbey of Königsfelden (1310; converted in 1872 into an asylum), in the vaults beneath which are interred many of the members of the Austrian royal family.

B R U G S C H, HEINRICH KARL (brögsh), a German Egyptologist, born in Berlin, Feb. 18, 1827. He early devoted himself to the study of Egyptian antiquities, and resided a number of years in Egypt, being for some time in the employment of the Egyptian Government, by which he was created a Bey, and latterly a Pasha. His "History of Egypt from the Monuments" has been translated into English. He died in Berlin, Sept. 11, 1894.

BRUISE, or CONTUSION, signifies an injury inflicted by a blow or sudden pressure, in which the skin is not wounded, and no bone is broken or dislocated. Both terms, and especially the latter, are employed in surgery to include all such injuries in their widest range, from a black eye to a thoroughly crushed mass of muscle.

With regard to treatment, simple and not very severe bruises require little treatment, but the rest necessary for the avoidance of pain; but the removal of the swelling and discoloration may be hastened by the application of various local stimulants, which seem to act by accelerating the circulation through the bruised part, and promoting the absorption of the effused fluid. Tincture of arnica has a great reputation; but experiments have made it very doubtful whether it is any more efficacious than simple spirit of the same strength. A solution of sulphurous acid, and hazeline and other preparations of the American witch-hazel are of more value. They should be kept constantly applied to the bruised part on lint or cotton wool. Bruises of a more severe nature, as when there is much breaking or crushing of the tissues, must, of course, at once be placed in the hands of a surgeon.

BRUMAIRE (brü-mär'), the second month of the year in the French Revolutionary calendar. It commenced on the 23d of October, and ended on the 21st of November, thus comprising 30 days. It received its name from the fogs that usually prevail about this time. The 18th of Brumaire, VIII. year (Nov. 9, 1799), is celebrated for the overthrow of the Directory, and the establishment of the sway of Napoleon.

BRUMMEL, GEORGE BRYAN (the sometime famous BEAU BRUMMEL), born in London, June 7, 1778. He was educated at Eton, and there formed intimacies with the younger nobility of the day. On his father's death, inheriting a fortune of about \$150,000, he began his career as a man of fashion, and became the intimate associate of the Prince of Wales (afterward George IV.). He it was who inaugurated the reign of dandyism, and for a period of 20 years exercised almost despotic sway over English society in the matter of dress. His fortune being soon swallowed up, he maintained his position in society by his success at play. After a rupture with the Prince, oppressed by debt, and the falling off of former friends, he retired to Calais, and afterward to Caen, where he was appointed British consul, and where he died, March 30, 1840.

BRUNAI (bröni), or **BRUNEI**, a British Protectorate in the N. W. of Borneo, till 1888 nominally an independent Mohammedan territory, whose sultan was formerly overlord of the whole island. Area, about 4,000 square miles; pop. est. at 30,000, divided into trade castes. The capital, Brunei, on a river of the same name, is a miserable, dirty town, built II—Cyc

on piles, with about 10,000 inhabitants, who trade with Singapore. See BORNEO.

BRUNANBURGH, the scene of a battle in which Athelstan and the Anglo-Saxons defeated a force of Scots, Danes, etc., in 937; locality very doubtful.

BRUNCK, RICHARD FRANCOIS PHILIPPE, a French philologist, born at Strassburg in 1729, was in military service in the Seven-Years' War, but in 1760 devoted himself to philological studies. He was an especial student of the Greek poets and his editions of them are among the very best. His editions of the Latin poets are less valuable. He died in Strassburg, June 12, 1803.

BRUNELLESCHI, FILIPPO DI SER LAPPY (brō-nel-es'kē), an Italian architect, born in Florence in 1377. After receiving a good education, he learned the goldsmith's art, practiced sculpture for a short time, and finally adopted architecture as his sole pursuit. About 1407 he was chosen to undertake the great task of completing the Duomo of his native city; its noble cupola is his principal title to fame. He built also the Pitti Palace and the church of St. Lorenzo at Florence. He was competitor with Ghiberti for the execution of the gates of the Baptistry. He was long a member of the Supreme Council of Florence, where he died April 16, 1446.

BRUNET, JACQUES CHARLES, a French bibliographer; born in Paris, Nov. 2, 1780; published a "Supplement" to the "Bibliographical Dictionary" of Duclos; "Manual du libraire et de l'amateur de livres" (1810, 5th ed. 1865); "Recherches bibliographiques et critiques sur les éditions originales des cinq livres du roman satirique de Rabelais" (1852), etc. He died in Paris, Nov. 16, 1867.

BRUNETIERE, FERDINAND (brün-tî'r'), a French critic, born in Toulon, July 19, 1849. He was the editor of the "Revue des Deux Mondes" and became a member of the French Academy in 1893. In criticism he inclined to the idealist as opposed to the naturalist school. His principal works are "History and Literature" (1884, 3 vols.); "The Naturalist Romance" (1883); "Essays on Contemporary Literature" (1892); "Epochs of the French Theater" (1892). In 1897 he delivered a series of lectures in American universities. He died Dec. 9, 1906.

BRUNHILDA (1) in the "Nibelungenlied," the young and stalwart Queen of Isenstein, wife of Gunther, the Burgundian king. She hated passionately Kriemhild and her husband, Siegfried, who had once been her own lover; and she caused

his murder by the hands of Hagen. Originally she was identical with the Norse Valkyrie Brynhildr, who, for a fault, was stripped of her divinity by Odin and sunk into a charmed sleep from which she was awoken by Sigurd (Siegfried). (2) The daughter of the Visigothic King Athanagild, married King Sigbert of Austrasia, in 567, and afterward, as regent of her two grandsons, Theodebert II., King of Austrasia, and Theodoric II., King of Bergundy, divided the government of the whole Frankish world with her rival Fredegond, who governed Neustria for the youthful Clotaire II. On the death of Fredegond, in 598, she seized on Neustria and, for a while, united under her rule the whole Merovingian dominions, but was overthrown in 613, by a combination in their own interests of the Austrasian nobles under the nominal leadership of Clotaire II., and put to death by being dragged at the heels of a wild horse.

BRUNI (brō'nē) ISLAND, an island off the S. part of the E. coast of Tasmania, from which it is separated by D'Entrecasteaux Channel. It has a length of 32 miles, a varying breadth of 1 to 11 miles, and an area of 160 square miles. Coal is mined.

BRÜNN (brön), an Austrian city, capital of Moravia, on the railway from Vienna to Prague, nearly encircled by the rivers Schwarza and Zwittawa. It contains a cathedral and other handsome churches; a *landhaus*, where the Provincial Assembly meets; and several palaces; and has extensive manufactures of woolens. It is the center of Moravian commerce. Near it is the fortress of Spielberg, in which Trenck and Silvio Pellico were confined. Pop. about 125,000.

BRUNNE (brön), ROBERT OF, the name by which ROBERT MANNING, a monk of the order founded by St. Gilbert of Sempringham, is usually designated. His monastery was in South Lincolnshire, near the modern town of Bourn and he lived in the reigns of Edward II. and Edward III. His chief work is his "Handlyng Synne," a free and amplified translation into English verse of William of Waddington's "Manuel des Pechiez." The purpose of the book was to convey religious instruction to the people in the agreeable form of moral anecdotes. He also made a new version in octosyllabic rhyme of Wace's "Brut d'Angleterre," and added to it a popular translation of the French rhyming chronicle of Peter Langtoft of Bridlington. Robert deliberately wrote in English instead of French, in order to reach the common people.

BRUNO, GIORDANO, an Italian philosopher, one of the boldest and most original thinkers of his age, born in Nola, about 1550. He became a Dominican monk, but his religious doubts compelled him to quit his monastery and Italy. He embraced the doctrines of Calvin at Geneva, but doubt and free discussion not being in favor there, he went to Paris. He gave lectures on philosophy and, by his avowed opposition to the scholastic system, made himself many bitter enemies. He next spent two years in England, and became the friend of Sir Philip Sidney. In 1585, he went again to Paris, and renewed his public lectures. After visiting and teaching in various towns in Germany, he returned, in 1592, to Padua, and went afterward to Venice, where he was, in 1598, arrested by the Inquisition and sent to Rome. He lay in prison two years, and, on Feb. 17, 1600, was burned as a heretic. His works in Latin and Italian are numerous, and abound in bold and noble thought and rich eloquence. Spinoza was indebted to Bruno for some of his theories. Among the works of Bruno are the following: "Della Causa," "Principio ed Uno," "Dell' Infinito Universo e Mondi," "La Cena delle Ceneri," "Specchia della Bestia Trionfante," etc.

BRUNO, ST., the Apostle of the Prussians, born in Querfurt, in 970. He was of a noble Saxon family, converted the Emperor Henry II., and was assassinated by the pagans of Lithuania in 1008.

BRUNO, ST., the founder of the Carthusian order of monks, born in Cologne about 1040; died in Calabria in 1101.

BRUNO THE GREAT, one of the most eminent men of his time, born about 925, the third son of Henry the Fowler. He became archbishop of Cologne, and chancellor of the empire under his brother, Otto I., and afterward, as a reward for his services, Duke of Lorraine. He strove to reform the monasteries and advance the love of learning among the clergy. He died in Rheims, Oct. 11, 965.

BRUNONIAN THEORY, a theory, or rather, hypothesis, according to which the living system was regarded as an organized machine endowed with excitability, kept up by a variety of external or internal stimuli, that excitability constituting life. Diseases were divided into sthenic or asthenic, the former from accumulated and the latter from exhausted excitability.

BRUNSWICK REPUBLIC, the former Duchy of Brunswick, in Germany, consists of five detached portions of territory on the rivers Weser, Leine, Ocker, and Aller. It occupies part of the vast

plain which stretches from the foot of the Hartz Mountains and their continuations (the Solling) to the German Ocean and the Baltic, with a portion of the rise of those chains on the N. side. The largest portion contains the districts of Wolfenbüttel and Schöningen, in which the cities of Brunswick and Wolfenbüttel, and the towns of Königslutter and Helmstedt, are situated. Two small detached portions of territory, viz., the circles of Thedinghausen on the Weser, and that of Badenburg, are inclosed by the Hanoverian territory, and form part, the former of the Weser district, the latter of the Leine district. Finally, the detached circle of Kalvorde, inclosed within the Prussian province of Saxony, belongs to the district of Schöningen. The duchy has an area of 1,418 square miles. The inhabitants are mostly engaged in agricultural and mining pursuits. Iron is the chief product of the mines worked in the Hartz, Weser and Blankenburg districts. Pop. about 495,000. On Nov. 9, 1918, a popular uprising forced the abdication of the reigning Duke, and Brunswick was proclaimed an independent state.

BRUNSWICK, the capital, is on the Ocker, in a level and fertile district, 143 miles W. S. W. of Berlin. It is supposed to have been founded in 861, by Bruno, Duke of Ostfalen. In the 13th century Brunswick became a member of the Hanseatic League, and soon attained considerable commercial prosperity, which declined with the decay of the League. The town is most irregularly built, with narrow and crooked streets. The cathedral (1173-1469), and the churches of St. Martin, St. Catharine and St. Andrew, with its steeple 341 feet high, are among the principal buildings; the old Rathaus is a fine specimen of Gothic. In the museum are some notable antiquities and works of art, by Jan Steen, Albert Dürer, Holbein, Rembrandt, Raphael, Guido Reni, Ruysdael, Michael Angelo and Benvenuto Cellini. The industry of the town before the World War consisted chiefly in manufactures of jute, woolen and linen, leather, sewing machines, chicory, beet sugar, tobacco, papier maché, and lacquered wares, and in publishing. A fine avenue of linden trees leads to the ducal palace, which, destroyed by fire in 1830 and 1865, was rebuilt in 1869. Pop. about 142,000.

BRUNSWICK, city and county-seat of Glynn co., Ga.; on St. Simon's Sound, 8 miles from the Atlantic Ocean; on the Atlanta, Birmingham and Atlantic, Atlantic Coast Line and the Southern railroads; 80 miles S. by S. W. of Savannah. Its settlement dates back more than 100

years, and its importance as a commercial port has been developed since the close of the Civil War. It has an admirable and spacious harbor, provided with a brick lighthouse; is connected with New York, Fernandina, and Savannah by regular steamship lines; and exports large quantities of cotton, phosphates, tar, turpentine and pine lumber. The city is the seat of a United States Marine Hospital; and is a popular summer and winter resort, with fine hotels. Pop. (1910) 10,182; (1920) 14,413.

BRUNSWICK, a town in Cumberland co., Me.; at the head of navigation on the Androscoggin river, and on the Maine Central railroad, 26 miles N. E. of Portland, and 8 miles W. of Bath. It is principally engaged in lumbering, milling and manufacturing; and is widely known as the seat of Bowdoin College and the Maine State Medical School. Pop. (1910) 5,341; (1920) 5,784.

BRUNSWICK, FAMILY OF, a distinguished family founded by ALBERT Azo II., Marquis of Reggio and Modena, a descendant, by the female line, of Charlemagne. In 1047 he married Cunigunda, heiress of the Counts of Altorf, thus uniting the two houses of Este and Guelph. From his son, GUELPH, who was created Duke of Bavaria, in 1071, and married Judith of Flanders, a descendant of Alfred of England, descended Henry the Proud, who succeeded, in 1125, and by marriage acquired Brunswick and Saxony. OTHO, the great-grandson of Henry by younger branch of his family, was the first who bore the title of Duke of Brunswick (1235). By the two sons of ERNEST of Zell, who became Duke in 1532, the family was divided into the two branches of Brunswick-Wolfenbüttel (II.) and Brunswick-Hanover, from the latter of which comes the present royal family of Great Britain. The former was the German family in possession of the duchy of Brunswick until the death of the last Duke in 1884. GEORGE LOUIS, son of Ernest Augustus and Sophia, granddaughter of James I. of England, succeeded his father as Elector of Hanover in 1698, and was called to the throne of Great Britain in 1714 as GEORGE I.

BRUNSWICK, FERDINAND, DUKE OF, fourth son of Duke Ferdinand Albert, born in Brunswick, in 1721. In 1739 he entered the Prussian service, was engaged in the Silesian wars, and in the Seven Years' War commanded the allied army in Westphalia. He drove the French from lower Saxony, Hesse and Westphalia, and was victorious at Crefeld and Minden. After the peace he retired to Brunswick, and died in 1792.

BRUNSWICK, FRIEDRICH WILHELM, DUKE OF, fourth and youngest son of Duke Karl Wilhelm Ferdinand of Brunswick, born in 1771. During the war against France, in 1792 and subsequently, he fought in the Prussian armies, was twice wounded, and once made prisoner with Blücher at Lübeck. For the campaign of 1809 he raised a free corps in Bohemia, but was compelled to embark his troops for England, where he was received with enthusiasm. His corps immediately entered the British service, and was afterward employed in Portugal and Spain, the Parliament granting him a pension of £6,000, until he returned to his hereditary dominions, 1813. The events of 1815 called him again to arms, and he fell at Quatre Bras, 1815. Caroline, wife of George IV., was a sister of this prince.

BRUNSWICK, KARL WILHELM FERDINAND, DUKE OF, born in 1735; entered upon the government in 1780. He received the chief command of the Austrian and Prussian army against France, in 1792, and designed to press forward from Lorraine to Paris, but, after taking Longwy and Verdun, was baffled in Champagne by Dumouriez, defeated at Valmy by Kellermann, and obliged to evacuate the province. In 1793 the Duke, in conjunction with the Austrians, opened the campaign on the upper Rhine, took Königstein and Mentz, and prepared to attack Landau. After a long struggle with varying success the Austrian lines were broken by Pichegru, and the Duke was obliged to follow their retreat across the Rhine. At Auerstadt he was mortally wounded, in 1806.

BRUNSWICK BLACK, a composition of lamp black and turpentine, used for imparting a jet black appearance to iron articles. A similar composition of finer quality is known as Berlin black.

BRUSH, an instrument used for painting, or for removing dirt by light rubbing, from floors, furniture, etc. They are generally made of hair, bristles, or whalebone, and are divided into two classes—simple and compound. Simple brushes are composed of a single tuft, and compound brushes consist of several tufts inserted in a handle. Painters' brushes are examples of the former, and ordinary hair brushes of the latter. The smaller kinds of simple brushes are known by the name of pencil, and are made of camel or sable hair, inserted in quills of different sizes. Compound brushes are so made that a number of tufts are inserted into holes perforated at regular distances in the back, or stock of the handle.

BRUSH TURKEY, a large gregarious species of bird, *talegalla lathami*. It is an inhabitant of Australia. It makes its nest in large mounds of brushwood, which it collects, and from which it takes its name.

BRUSSELS (French *Bruxelles*), the capital of Belgium; on the river Senne, communicates with Antwerp and the North Sea by means of the Scheldt canal, and railroads connect it with Germany, France, and Holland, as well as with all the principal towns of Belgium. The city is built partly on the side of a hill and partly on a fertile plain. French is spoken in the upper part of Brussels; in the lower, Flemish is prevalent, and in one quarter the Walloon dialect is spoken. The English language, owing to the number of English who reside in the city, for economy, is also very common. Besides the fine park in the Upper Town, which covers an area of some acres and is ornamented with fountains and statues, and surrounded by the King's palace, the Palace of the Prince of Orange, the Chamber of Representatives, and other buildings, Brussels has several other squares or places, among which the most noteworthy are: the Place Royale, with the colossal monument of Godfrey of Bouillon; the Grand Place, in which is situated the Hôtel de Ville, a splendid Gothic structure, erected in the beginning of the 15th century, with a pyramidal tower 364 feet high, surmounted by a statue of St. Michael, the patron saint of Brussels, and where, in 1568, the patriot Counts, Egmont and Horn, were beheaded by order of the Duke of Alva; and the Place des Martyrs, where a memorial has been erected to those who fell here in the Revolution of 1830. Among the churches of Brussels the largest and finest is the Cathedral of St. Gudule, which dates from the 12th century. In the Palais des Beaux Arts is the picture gallery, containing the finest specimens of the Flemish school; the Public Library, with its 234,000 volumes and its 20,000 MSS. The observatory is one of the finest in Europe. The educational establishments of Brussels are numerous, the principal being the free university, founded in 1834, with four faculties. It is the seat of the Provincial Government of South Brabant, as well as of the General Government of the Kingdom. Brussels is one of the chief centers of the industry of the country. Its lace is particularly famous. Of carpets which pass under the name of Brussels carpets only a few are manufactured here, most of those of Belgian make being produced at Tournai. Brussels was occupied by the Germans Aug. 20, 1914, and

held by them until November, 1918. Pop. about 180,000, with suburbs, 730,000. See BELGIUM, and WORLD WAR.

BRUSSELS SPROUTS, the small sprouts or heads, each a perfect cabbage in miniature, springing from the stalks of a species of cabbage. They were originally brought from Belgium.

BRUSSILOFF, ALEXEI ALEXEIE-VITCH, a Russian General, born in Kutais, Russian Caucasus, in 1853. He entered the profession of arms as a lieutenant of cavalry, and had a reputation in the army for his daring horsemanship. He served with distinction in the Russo-Turkish War, 1877-1878. In 1911 he was stationed in Podolia, as the commander of an army corps. When the World War broke out he invaded Galicia and achieved some remarkable victories. In April, 1916, he succeeded General Ivanoff as commander of the southwestern group of armies, and in June of that year defeated the Teutonic forces overwhelmingly in Volhynia and Galicia, capturing great numbers of prisoners and immense supplies of material and munitions. After the deposition of the Czar, the Russian armies began to disintegrate under the influence of the Bolshevik propaganda, and despite herculean attempts on Brusiloff's part to retain discipline, he was unable to resist the inevitable. He was made Commander-in-Chief of all the Russian armies, during the brief spell of Kerensky's control. Soon afterward the Russian front collapsed, and negotiations were entered into looking toward a separate peace between Russia and the Central Powers. For a long period after this little was heard of Brusiloff, and there were reports that he had died; but in 1920 he was Commander-in-Chief of the Red armies engaged in the Polish campaigns.

BRUT, or **BRUTUS**, the eponymous Trojan hero who gave his name to the island of Britain, according to Geoffrey of Monmouth, Wace, Layamon, and all the earlier historians in verse or prose. The great-grandson of Æneas, he was banished from Italy, and after many adventures, found his way to Albion, then the abode of giants, who were not destroyed without desperate fighting.

BRUTUS, DECIMUS JUNIUS, a Roman soldier, served under Julius Cæsar in Gaul, and was afterward commander of his fleet, but, like his relative, Marcus Junius Brutus, joined in the assassination of Cæsar. He was afterward, for a short time, successful in opposing Antony, but was deserted by his soldiers in Gaul and betrayed into

the hands of his opponent, who put him to death in 43 B. C.

BRUTUS, LUCIUS JUNIUS, an ancient Roman hero, son of Marcus Junius,



MARCUS JUNIUS BRUTUS

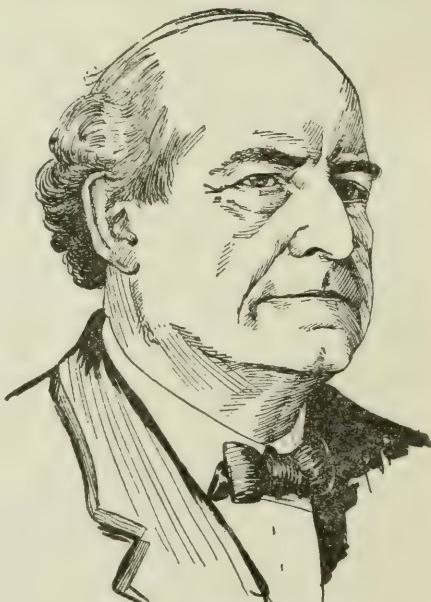
by the daughter of the elder Tarquin. He saved his life from the persecutions of Tarquin the Proud by feigning himself insane, whence his name Brutus (stupid). On the suicide of Lucretia, however, he threw off the mask, and headed the revolt against the Tarquins. Having secured their banishment, he proposed to abolish the regal dignity and introduce a free government, with the result that he was elected to the consulship, in which capacity he condemned his own sons to death for conspiring to restore the monarchy. He fell in battle 509 B. C.

BRUTUS, MARCUS JUNIUS, an illustrious Roman, one of the murderers of Julius Cæsar. His mother was the sister of Cato. He at first sided with Pompey, but, being treated with great lenity after the battle of Pharsalia, he attached himself to Cæsar, by whom he was greatly caressed and trusted. But the stern Republican spirit of Brutus rendered it impossible for all Cæsar's kindness to him to reconcile him to Cæsar's ambition; and he at length conspired with Cassius and

others, and slew him on the Ides of March 44 B. C. Antony succeeded in exciting the popular indignation against the murderers, who fled from Rome, and raised an army, of which Brutus and Cassius took the command; but being totally defeated at the battle of Philippi, where they encountered the army of Antony and Octavianus, Brutus escaped with only a few friends, and believing his cause ruined urged his friend Strato to kill him. This for a time the latter refused to do, but at last, presenting the sword as he turned away his face, the noble Roman fell on it and expired, 36 B. C., in the 43d year of his age.

BRYACEÆ, urn mosses, a natural order of muscals, distinguished by having the spore cases valveless, with an operculum without elaters. Lindley enumerated 44 genera, and, with a query, 1,100 species as belonging to the order. They are found in all humid climates, but abound in the temperate rather than in the polar regions. The word is also applied to a large group of acrocarpous mosses having a double row of teeth, the inner united at the base by a common pli-
cate membrane. It constitutes part of the order *bryaceæ*.

BRYAN, WILLIAM JENNINGS, an American political leader, born in Salem,



WILLIAM JENNINGS BRYAN

Ill., March 19, 1860. He was graduated at Illinois College in 1881, preparing subsequently for the bar at Union Col-

lege, Chicago. In 1887 he removed to Lincoln, Neb., and was elected to Congress in 1890, and again in 1892. Four years later he was nominated for the



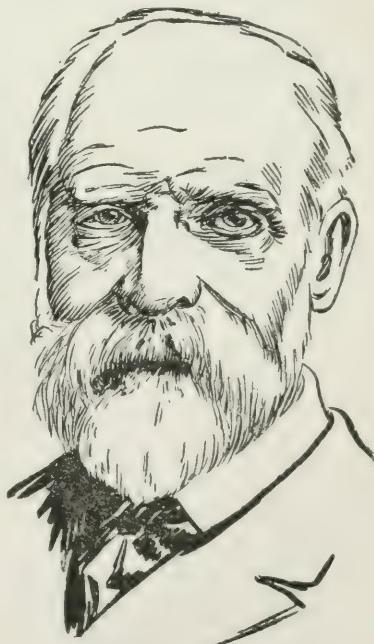
WILLIAM CULLEN BRYANT

Presidency of the United States by the Democratic National Convention at Chicago. He advocated the free and unlimited coinage of silver by the United States at a ratio of 16 to 1, regardless of the action of other nations. The Presidential campaign resulted in his defeat. During the war with Spain, he became Colonel of a regiment of volunteers, but saw no field service. In 1900, he again appeared as Democratic candidate for the Presidency upon a platform of free silver, opposition to trusts, and anti-imperialism, and was again defeated by William McKinley. He made a tour of the world in 1906. In 1908 he was defeated for the Presidency by William H. Taft. He was appointed Secretary of State by President Wilson, March 4, 1913, and resigned Jan. 9, 1915. While in office he negotiated treaties with 30 nations. After resigning, devoted himself to lecturing. He took no active part in politics until the Democratic Convention of 1920, when he fought for the insertion of a prohibition plank in the platform. In this he failed. Publications: "Under Other Flags" (1904); "The Old World and Its Ways" (1907).

BRYANT, WILLIAM CULLEN, an American poet, born in Cummington, Mass., Nov. 3, 1794. After two years in Williams College, he turned his attention to law. But in early youth he produced "Thanatopsis," and some of his best lyrics—"To a Waterfowl," "The Yellow

Violet," etc. In 1829 he became editor-in-chief of the New York "Evening Post." His books include "Letters of a Traveler" (1855); "Letters from Spain" (1859); "Letters from the East" (1869); and a "Popular History of the United States," with S. H. Gay (4 vols., 1878-1882). His "Poems" appeared in New York in 1832. This was followed by "The Fountain and Other Poems" (1842), and "The White-Footed Deer and Other Poems" (1844). His first complete edition was issued in Philadelphia in 1846. In his old age Bryant began a translation of the "Iliad" and "Odyssey," in blank verse; and his last great poem was "The Flood of Years," a noble pendant to "Thanatopsis." He died in New York, June 12, 1878.

BRYCE, GEORGE, a Canadian educator and clergyman, born in Mount Pleasant, Ontario, April 22, 1844. He was graduated at the University of Toronto in 1867, and was ordained to the Presbyterian ministry in 1871. His great work was the foundation of Manitoba College and in assisting the foundation of Manitoba University. He has written "Manitoba," and "A Short History of the Canadian People."



VISCOUNT JAMES BRYCE

BRYCE, JAMES, VISCOUNT, an Irish historian, born in Belfast, May 10, 1838. After graduating at Oxford in 1862, he

studied at Heidelberg, and subsequently practiced law in London. From 1870 till 1893 he was Regius Professor of Civil Law in Oxford, and had a distinguished political career. He has supported Home Rule, city reforms, and international copyright. Chief Secretary for Ireland 1905-1906. He was ambassador to the United States 1907-1912, and was created Viscount Bryce of Dechmont in 1914. His chief works are "The Holy Roman Empire" (1864); "Transcaucasia and Ararat" (1877); "The American Commonwealth" (1888); "Studies in Contemporary Biography" (1903); "South America" (1912); "Addresses" (1913).

BRYCE, LLOYD, an American editor and novelist, born in Long Island, N. Y., in 1852. He was editor of the "North American Review" from 1889 to 1896. His works are "Paradise," "A Dream of Conquest," "The Romance of an Alter Ego," "Friends in Exile," "The Literary Duet," etc. He died in 1917.

BRYN MAWR COLLEGE, an institution for the higher education of women, located at Bryn Mawr, Pa. It was founded in 1880. The President is Miss M. Carey Thomas. The faculty numbers 67, and there were 458 students enrolled in 1919. Productive endowment funds amount to over \$2,000,000. The library contains 94,000 volumes.

BRYONY, or BRYONIA, a plant, *bryonia dioica*. It has a large root, white and branched. Its stem is long and weak, with tendrils which enable it readily to cling to bushes in the hedges and thickets where it grows. The inflorescence consists of short axillary racemes of whitish dioecious flowers with green veins. The berries are red. The plant abounds in a fetid and acrid juice. Also a genus of plants belonging to the order *cucurbitaceæ* (cucurbits). *B. alba*, or blackberryed bryony, which grows on the continent of Europe, is by some believed to be only a variety of the *dioica*. Several other species are found in the East Indies.

BRYOPHYLLUM, a genus of plants belonging to the order *crassulaceæ* (houseleeks). There are eight stamens and four ovaries. *B. calycinum*, the large cupped bryophyllum, has succulent, oval, crenate leaves and long, pendulous, cylindrical flowers. Its native country is the East Indies, whence it has been carried to other places. In Bermuda, where it is naturalized and grows abundantly, it is called life plant.

BRYOZOA, the name given by Ehrenberg to a class of molluscid animals, the

peculiarities of which had been previously observed by J. V. Thompson, who had called them polyzoa.

BRYUM, a genus of mosses, the typical one of the family *BRYACEÆ* (q. v.).

BUBALIS, a genus in the antelope division of hollow-horned, even toed ruminants, not to be confused with the genus *bubalis*—the *BUFFALO* (q. v.). The species of *bubalis* are among the more oxlike antelopes, and one of them is supposed to be the *bubalus* of the ancients. In this genus the head is elongated, the snout broad, the horns twisted and present in both sexes, the tear pits small, the back sloping off behind, the teats two in number. The *bubaline* of the north African deserts (*B. mauretanica*=*antilope bubalis*) is a handsome animal of a reddish brown color, standing about 5 feet high at the shoulder, living in herds, and readily tamed. It is figured on Egyptian monuments. The *hartebeest* (*B. caama*) is found in the S., is perhaps slightly larger, has a general gray brown color (black on the outside of the legs and on middle of forehead, with large white spots on haunches), and is at home on the mountains. The *sassaby* (*B. lunata*), the *bastard hartebeest* of the Cape Colonists, is slightly smaller, and is differently colored. The *bontebok* (*B. pygarga*) is a smaller and more beautifully colored form of the S. interior, where another species, the violet colored *blesbosk*, is also abundant.

BUBASTIS, an ancient Egyptian town, so named from the goddess Bast, supposed to answer to the Greek Artemis or Diana. The cat was sacred to her, and the *bubasteia* or festivals of the goddess were the largest and most important of the Egyptian festivals.

BUBO, hardening and enlargement of lymphatic glands, generally the inguinal, as in the Oriental or Levantine plague, syphiloid, gonorrhœa, etc., always, unless dissipated by medical interference, followed by suppuration. In cases of true infecting syphilis a suppurating *bubo* is a rare complication, although induration of the glands in the later forms of the disease is almost invariably present.

BUBO, a genus of birds belonging to the family *strigidæ*, or owls. They have a small ear aperture, two large feathered tufts like horns on the sides of the head, and the legs feathered to the toes. *B. maximus* is the eagle owl, or great owl. It is a native of Europe. The corresponding American species is *B. virginianus*.

BUBONIC PLAGUE, a disease supposed to be identical with the plague known as the Black Death, which had its origin in China, and made its first appearance in Europe 543 A. D., at Constantinople. It derives its modern name from the fact that it attacks the lymphatic glands in the neck, armpits, groins and other parts of the body. The swollen parts are extremely sensitive to the touch, the patient suffers from headache, vertigo, high fever, vomiting, and great prostration. Another feature is the appearance of purple spots and a mottling of the skin. In severe cases death generally ensues in 48 hours, and, at best, recovery is slow. It is now generally agreed that this plague is a germ disease. The bacillus has been identified by Indian bacteriologists as well as by European and American investigators. It is found without trouble in the blood of the patient. At the Hoagland laboratory in Brooklyn, N. Y., extensive experiments have been made, both in the culture of the germs and in an anti-toxin, by means of which immunity from this scourge may be obtained. The disease has been called "the poor's plague," from the fact that it first attacked the half-starved masses who congregate in the slums of the cities. This was the case in Bombay, where it has produced fatal ravages. Pure air, wholesome food, the free external use of cold water, and proper sanitary regulations modify to some extent the attacks of the plague.

History.—The first authentic description of the bubonic plague is contained in the writings of Rufus of Ephesus, who described the disease as having existed in northern Africa during the 3d or 4th century B. C. Since that time the disease has been variously described by writers under the name of Levantine, Oriental and Bubonic Plague and the Black Plague, or Black Death. These designations are more or less open to criticism and lack scientific foundation. In the reign of Justinian, 542 A. D., the disease appeared in Egypt, and within a year extended to Constantinople, where it is said to have caused the death of 10,000 persons in one day. In 1352 the plague spread through the whole of Europe and nearly one-fourth of the population died. It is estimated by Hecker that, during this reign of terror, out of 2,000,000 inhabitants of Norway but 300,000 survived. It was estimated, by Pope Clement VI., that the mortality from black death for the entire world was 40,000,000. This outbreak lasted about 20 years. During the great plague of London, in 1665, there were 63,596 deaths out of a population of 460,000.

Characteristics.—The bacillus of the bubonic plague was discovered and studied by Kitasato and Yersin, working independently, and at about the same time, in 1894, during the epidemic of the plague at Hong Kong. It is found in large numbers in the pus, in the lymphatic glands, and occasionally in the internal organs. It is apparently present in the blood only in the acute hemorrhagic types of the disease, and shortly before death. An anti-plague serum injected into a young Chinaman, at the Catholic mission at Canton, in June, 1896, who was attacked with a severe type of the disease, was effective. It is believed the plague is transmitted solely through infection from previous cases. It is apparent, however, that hot, dry air is fatal to the disease, and that moist warm air is favorable to it. It even may be very active in cold weather. This was shown by the outbreak that occurred on the Volga river, in Russia, in the severe winter of 1878. Like typhus fever, the plague is unknown in the tropics, and, like typhus, again, it usually selects its victims from the lowest class, and thrives on filth and famine. The invasion is abrupt, associated with chills, great depression, blunted condition of the intellect, pains in the bones and high fever. Death frequently occurs within 48 hours, and even earlier.

Remedies.—The chief causes of the plague are given as famine and filth. The various serums seem to be unavailable against these obstacles and even the use of antipyretics or stimulants. As a preventive serum, that of Professor Haffkins has proven the most effectual. The compulsory evacuation of infected cities and districts has accomplished much. Indeed, this was the most available remedy during the epidemic in the Punjab District in 1896-1897, and is the first preventive of a spread in case of an outbreak.

Animals also have a tendency to spread the plague. Mice, rats, cats and monkeys have been known to infect a ship and bring the scourge from a foreign port. Excessive precautions are taken at all ports leading from Asia, that of the Suez canal being the most dangerous and carefully guarded highway into Europe.

Precautions, however, are quite impossible in the incipient stages of the disease, as the evidences may not appear in the victim till he or she is already marked for death.

The white races are more immune than any other. The mode of life in civilized countries is conducive to successful battle with the plague. As it is rather sporadic than epidemic, even in

the East, there should be little fear of its securing a foothold on Western soil.

BUCARELI Y URZUA, ANTONIO MARIA, a Spanish soldier and administrator; born in Seville, Jan. 24, 1717; was governor of Cuba in 1760-1771, and viceroy of New Spain (Mexico) from 1771 till his death in Mexico City, April 9, 1779.

BUCCANEER, an order of men, not quite pirates, yet with decidedly piratical tendencies, who for nearly 200 years infested the Spanish main and the adjacent regions. A bull of Pope Alexander VI., issued in 1493, having granted to Spain all lands which might be discovered W. of the Azores, the Spaniards thought that they possessed a monopoly of all countries in the New World, and that they had a right to seize, and even put to death, all interlopers into their wide domain. Enterprising mariners belonging to other nations, and especially those of England and France, considered themselves at liberty to push their fortunes within the prohibited regions. Being cruelly treated, when taken, by the Spaniards, their comrades made reprisals, and a state of war was established between the Spanish governments in the New World and the adventurers from the Old. The association of buccaneers began about 1524, and continued till after the English revolution of 1688, when the French attacked the English in the West Indies, and the buccaneers of the two countries, who had hitherto been friends, took different sides, and were separated forever. Thus weakened, they began to be suppressed between 1697 and 1701, and soon afterward ceased to exist. The buccaneers were also called "filibustiers," or filibusters."

BUCCINATOR, the trumpeter's muscle, one of the maxillary group of muscles of the cheek. They are the active agents in mastication, and are beautifully adapted for it. The buccinator circumscribes the cavity of the mouth and, aided by the tongue, keeps the food under the pressure of the teeth; it also helps to shorten the pharynx from before backward, and thus assists in deglutition.

BUCCINIDÆ, a family of mollusks belonging to the order prosobranchiata, and the section siphonostomata. They constitute part of Cuvier's *buccinoida*. They have the shell notched in front, or with the canal abruptly reflected so as to produce a varix on the front of the shell. The leading genera are *buccinum terebra*, *eburna*, *nassa*, *purpura*, *cassis*, *dolium*, *arpa* and *oliva*.

BUCCINUM, the typical genus of the family buccinidæ. In English they are called whelks, which are not to be confounded with the periwinkle, also sometimes called whelk. *B. undatum* is the common whelk. Species of the genus exist in the cretaceous rocks, but it is essentially Tertiary and recent.

BUCCLEUGH (bu-klö), the title (now a dukedom) of one of the oldest families in Scotland, tracing descent from Sir Richard le Scott in the reign of Alexander III. (latter half of the 13th century), and first becoming conspicuous in the person of the border chieftain Sir Walter Scott, of Branxholm and Buccleugh—the latter an estate in Selkirkshire. The son of Sir Walter, bearing the same name, was, for his valor and services, raised to the peerage, in 1606, as Lord Scott of Buccleugh, and his successor was made an Earl in 1619. In 1663 the titles and estates devolved upon Anne, daughter of the second Earl, who married the Duke of Monmouth, illegitimate son of Charles II., the pair, in 1673, being created Duke and Duchess of Buccleugh, etc. Subsequently the Dukedom of Queensberry passed, by marriage, into the family.

BUCENTAUR, a mythical monster, half man and half ox. The splendid galley in which the Doge of Venice annually wedded the Adriatic bore this name, doubtless because of the figure of a bucentaur on her bow. Three ships were built for this ceremony, enjoined by Pope Alexander III., and all bore a bucentaur figure-head; and the last one was destroyed by the French in 1798.

BUCER, MARTIN (bü-sä' or bü'ser), a Protestant reformer, born in Alsace, in 1491; first united with Luther, but afterward inclined to Zwinglius, though he labored much to bring the two parties into a union. He went to England, in 1549, and was made Divinity Professor at Cambridge, where he died, Feb. 28, 1551. In the reign of Mary, his body was taken up and burned. His writings are very numerous.

BUCHANAN, JAMES, an American statesman, 15th President of the United States, born near Mercersburg, Pa., April 23, 1791; graduated at Dickinson College in 1809, admitted to the bar in 1812. He supported the War of 1812, although affiliated with the Federalist party. In 1820 he was elected to Congress, serving successive terms by re-election for 10 years, where he made some reputation in the advocacy of bills for reorganizing the courts and judiciary. In 1828 he supported Andrew Jackson

for the Presidency, who, in turn, appointed him Minister to Russia, where he distinguished himself by arranging an important commercial treaty. In 1834, he entered the United States Senate, serving there 12 years, where he defended the spoils system instituted by Jackson, and declared against the right or power of the Government to interfere with slavery in the States. He was appointed Secretary of State by President Polk, after which service he was in retirement for four years. Under President Pierce he was sent in 1853 as Min-



JAMES BUCHANAN

ister to England, where his advocacy of the annexation of Cuba by the United States led to his nomination to the Presidency in 1856. His cabinet contained men who supported the secession of South Carolina, and eventually joined the Confederacy. While holding that the States had no right to secede, he announced in 1860 that the President had neither the right nor the constitutional power to prevent a State from seceding. This unwillingness to take decisive action enabled the seceding States to arm and prepare for war before the Government did anything to prevent. After he retired, however, he supported the Union cause. He died in Lancaster, Pa., June 1, 1868.

BUCHANAN, ROBERT WILLIAMS, an English author, born in Warwickshire, Aug. 18, 1841. He received his education in Glasgow, and while young went to London to engage in literature. His attack upon Dante Gabriel Rossetti drew a famous letter from that poet on "The Stealthy School of Criticism," and a scathing pamphlet from Swinburne, "Under the Microscope" (1872). His poems include "London Poems" (1866); "Ballads of Love, Life and Humor" (1882); "The City of Dreams" (1888); etc. Buchanan also wrote novels and plays. He died in London, June 10, 1901.

BUCHANANIA a genus of *anacardiaceæ* (anacards). *B. latifolia* is a large Indian tree, the kernel of the nut of which is much used in native confectionery. It abounds in a bland oil. A black varnish is made from the fruits. The unripe fruits of *B. lancifolia* are eaten by the natives of India in their curries.

BUCHAREST (bö'char-est), the capital of the former principality of Wallachia and of the present kingdom of Rumania, stands 265 feet above sea-level, in the fertile but treeless plain of the small, sluggish Dambovitză. By rail it is 716 miles S. E. of Vienna, 40 N. of Giurgevo on the Danube, and 179 N. W. of Varna on the Black Sea. A strange meeting point of East and West, the town still has many narrow and crooked streets, though the latter are now mostly paved and lighted with gas and electricity. An elaborate system of fortification was undertaken in 1885. There are some handsome hotels; and the metal-plated cupolas of the innumerable churches give to the place a picturesque aspect. The royal palace was rebuilt in 1885; and the Catholic Cathedral is a fine edifice of 1875-1884. The number of cafés and gambling tables is excessive; and, altogether, Bucharest has the unenviable reputation of being the most dissolute capital in Europe, with all the vices but few of the refinements of Paris. There is, however, a university, founded in 1864. The Corso, or public promenade, is a miniature Hyde Park. Bucharest is the *entrepôt* for the trade between Austria and the Balkan Peninsula, the chief articles of commerce being textile fabrics, petroleum, grain, hides, metal, coal, timber, and cattle. Its manufactures include refined petroleum, vegetable oils, flour, soap, candles, etc., and the workmen are chiefly Hungarians and Germans. Besides the university there are a number of other educational institutions, museums, hospitals, and other charitable institutions. Bucharest has

been several times besieged; and between 1793 and 1812 suffered twice from earthquakes, twice from inundations, once from fire, and twice from pestilence. Here in 1812 a treaty was concluded between Turkey and Russia, by which the former ceded Bessarabia and part of Moldavia; in 1886 the treaty between Servia and Bulgaria was made here; in 1913 the division of the captured parts of Turkey (see BALKAN WARS) was arranged in Bucharest; and in 1918 the treaty between Rumania and the Central Powers, terminating the war between these countries, was made here. During the WORLD WAR (*q. v.*) Bucharest, in common with the rest of Rumania, suffered much as the result of the invasion by the Central Powers. It was captured early in December, 1916, and it was only two years later, on Dec. 3, 1918, that the King of Rumania was able to re-establish his government, which during the invasion had been moved to Jassy, in the capital of the country. Pop. about 350,000.

BUCHAREST, TREATY OF, the agreement which terminated the war between Rumania and the Central Powers, signed at Bucharest, May 6, 1918. The withdrawal of Russia from the war had robbed Rumania of her only strong ally in eastern Europe, and thus had made her defeat inevitable. At the end of November, 1917, the eastern front from Bukowina to the Black Sea had been held by a combined force of Russians and Rumanians. The former were composed of 450,000 men and the latter of about 180,000. When the Russian armistice was signed, Rumania was compelled by the threats both of the Germans and the Russians themselves to adhere to it. While the Russo-Teuton conferences were in progress, the Russian armies melted away rapidly, and Rumania was left alone to confront, with vastly inferior forces and supplies, the victorious troops of Von Mackensen, who had already captured a large part of their territory, and who could now be re-enforced by the other German and Austrian armies released from the fighting on the Russian front. For a time, help was promised by the Ukraine, but this last hope faded when the latter country signed its separate peace with the Central Powers. It was simply a case of capitulation or annihilation, and the little country bowed to the inevitable. On Feb. 6, 1918, Field Marshal Von Mackensen dispatched an ultimatum to the Rumanian Government, then at Jassy, demanding that peace negotiations be begun within four days. After fruitless efforts at delay, the Govern-

ment acquiesced and discussions were begun. They were protracted, however, through the unwillingness of Rumania to accept the drastic terms proposed by her conquerors, and a second ultimatum was sent by the Germans on March 4, giving the kingdom twenty-four hours to accept the terms or be crushed. There was no alternative and a preliminary treaty was signed which was to be the basis of a final treaty to be concluded later. This final treaty was signed May 6, 1918, at Bucharest, from which it takes its name.

In general, the effect of the treaty was to leave Rumania with only a shadow of real independence and to put all her natural resources under the control of the victors. This was confirmed by her bitter experience following the signing of the treaty, when she was ground down and plundered by the exactions of the German armies.

As in the case of the Brest-Litovsk treaty, the Allies denounced the iniquitous provisions of the treaty of Bucharest and promised that it should be annulled. This was done when the peace treaty that ended the war was signed at Versailles, June 28, 1919.

BUCHTEL, HENRY AUGUSTUS, an American educator, born in Akron, O., in 1847. He graduated from De Pauw University in 1872 and in the same year was ordained to the Methodist Episcopal ministry. After serving a year as missionary in Bulgaria he filled pastorates in several cities in Illinois, Denver, Indianapolis, and East Orange, N. J. In 1900 he was chosen chancellor of the University of Denver. He was elected Governor of Colorado in 1907, serving until 1909.

BUCHTEL COLLEGE. See AKRON, MUNICIPAL UNIVERSITY OF.

BUCHU, a south African name for several species of barosma, especially *B. crenata*, *crenulata*, and *serratifolia*. They belong to the order rutaceæ, and the section *endiosmexæ*. They have a powerful and usually offensive odor, and have been recommended as antispasmodics and diuretics.

BUCK, a name sometimes distinctively appropriated to the adult male of the fallow deer, the female of which is a doe. The term is often also applied to the male of other species of deer, as of the roebuck, although never to that of the red deer, which, when mature, is a stag or a hart.

BUCK, BEAUMONT BONAPARTE, an American army officer, born in Mayhew, Miss., in 1860. He graduated from

the United States Military Academy in 1885 and from the Army War College in 1909. He was made brigadier-general, Aug. 5, 1917, and went with the First Expeditionary Force to France. He commanded the Third Division of the Fifth Army Corps and did excellent work in the Meuse-Argonne offensive. In 1918 he was promoted to the rank of major-general. He received the D. S. C. and various foreign decorations.

BUCK, DUDLEY, an American organist, composer, and author, born in Hartford, Conn., March 10, 1839. He was for many years organist of churches in Brooklyn, N. Y. Aside from a number of cantatas, he has written several books: "A Dictionary of Musical Terms," a work on the "Influence of the Organ in History" (1882), etc. The "Centennial Cantata," for the opening of the Exposition of 1876, by appointment of the United States Centennial Commission, the "Forty-Sixth Psalm," the "Legend of Don Munio," the "Golden Legend," of Longfellow, and the "Marmion" symphonic overture, are among his larger works with orchestra. He has also employed his pen in the composition of chamber music, songs, and male voice music. Among his larger works are the "Voyage of Columbus," and the "Light of Asia." He died Oct. 6, 1909.

BUCKBEAN, the English name of *menyanthes*, a genus of plants belonging to the order *gentianaceæ* (gentian worts). Especially the name of *menyanthes trifoliata*, called also marsh trefoil. It has densely creeping and matted roots, ternate leaves, and a compound raceme or thyrsus of white flowers, tipped externally with red, and beautifully fringed within with white thread-like processes. An infusion of its leaves is bitter, and is sometimes given in dropsy and rheumatism. In Sweden two ounces of the leaves are substituted for a pound of hops. In Lapland the roots are occasionally powdered and eaten.

BUCKET SHOP, an office for gambling in fractional lots of stocks, grain, etc., with no delivery of securities or commodities sold or purchased. The operation of bucket shops is regulated by law in most cities of the United States.

BUCKEYE, the American horse chestnut tree, the *æsculus ohioticus* of botanists.

BUCKHOUND, a kind of hound similar to, but smaller than, a staghound, once commonly used in Great Britain for hunting bucks. The Master of the Buck Hounds is still the title of an officer of the royal household in England.

BUCKINGHAM, GEORGE VILLIERS, DUKE OF, favorite of James I. and Charles I., of England, born in 1592, his father being George Villiers, Knight. At 18 he was sent to France, where he resided three years, and on his return made so great an impression on James I. that in two years he was made a knight, baron, viscount, Marquis of Buckingham, lord high admiral, etc., and at last dispenser of all the honors and offices of the three kingdoms. In 1623, when the Earl of Bristol was negotiating a marriage for Prince Charles with the Infanta of Spain, Buckingham went with the Prince incognito to Madrid to carry on the suit in person. The result, however, was the breaking off of the marriage, and the declaration of war with Spain. During his absence Buckingham was created duke. After the death of James in 1625 he was sent to France as proxy for Charles I. to marry the Princess Henrietta Maria. In 1626, after the failure of the Cadiz expedition, he was impeached, but saved by the favor of the King. Despite the difficulty in obtaining supplies Buckingham took upon himself the conduct of a war with France, but his expedition in aid of the Rochellese proved an entire failure. He was stabbed on Aug. 24, 1628, at Portsmouth, by John Felton, an ex-lieutenant who had been disappointed of promotion.

BUCKINGHAM, GEORGE VILLIERS, DUKE OF, son of the preceding, born at Westminster in 1627; studied at Trinity College, Cambridge; served in the Royal army under Rupert and then went abroad. In 1648 he returned to England, was with Charles II. in Scotland and at the battle of Worcester, and afterward served as a volunteer in the French army in Flanders. He then returned to England, and in 1657 married the daughter of Lord Fairfax. At the Restoration he became master of the horse and one of the King's confidential *cabal* (1667-1673). In 1666 he engaged in a conspiracy, and in 1676 was committed to the Tower for a contempt by order of the House of Lords; but on each occasion he recovered the King's favor. On the death of Charles he retired to his seat in Yorkshire, where he died in 1688.

BUCKINGHAM, WILLIAM ALFRED, an American statesman, born in Lebanon, Conn., May 28, 1804; was for nine years Governor of Connecticut (1858-1866); called the "War Governor" for his zeal in furnishing troops in the Civil War; and was United States Senator from 1869 till his death. He was a patron of Yale College. He died in Norwich, Conn., Feb. 3, 1875.

BUCKINGHAM PALACE, a royal palace in London, facing St. James' Park, and the principal London residence of the British ruler.

BUCKINGHAMSHIRE, a county of England in the south-midland section. It has an area of about 743 square miles, of which over 80 per cent. is cultivated. The chief agricultural products are wheat and oats. Dairying is also an important industry. In the northern part of the county is considerable woodland. There are a few manufacturing industries. The chief rivers are the Thames, the Ouse, the Ouse, the Colle, and Thame. The principal towns are Aylesbury, Buckingham, Slough, and Wycombe. The estimated population in 1917 was 205,164.

BUCKLANDIA, a magnificent and beautiful evergreen tree of the order *hamamelidæ*, a native of the Himalayas, and growing in the island of Sumatra. The timber is not valuable.

BUCKLE, HENRY THOMAS, an English historian, born in Kent, Nov. 24, 1822. At an early age he entered his father's counting house, but at 18, on inheriting his father's fortune, he devoted himself entirely to study. The only thing he allowed to distract him from his more serious pursuits was chess, in which he held a foremost place among contemporary players. His chief work, a philosophic "History of Civilization," of which only two volumes (1858 and 1861) were completed, was characterized by much novel and suggestive thought, and by the bold coordination of a vast store of materials drawn from the most varied sources. He died, while traveling, at Damascus, March 29, 1862.

BUCKLES, metal instruments, consisting of a rim and tongue, used for fastening straps or bands in dress, harness, etc. Both brass and iron are used for them, the chief kinds being called tongue, roller, brace, and gear buckles. The use of buckles, instead of shoe strings, was introduced into England during the reign of Charles II. They soon became very fashionable, attained an enormous size, and were usually made of silver, set with diamonds and other precious stones.

BUCKLEY, JAMES MONROE, American Methodist clergyman and editor; born in Rahway, N. J., Dec. 16, 1836. He was educated at Pennington Seminary, Wesleyan University, and at Exeter, N. H. He entered the Methodist ministry in 1858, and speedily attained distinction by his gift of

extemporaneous eloquence. He was in great demand as a lecturer. It is as an author and editor, however, that he exerted his greatest influence. He was a powerful force in shaping the policies of his denomination and was noted as a forceful fighter and formidable debater. He edited the chief organ of his denomination, "The Christian Advocate," from 1880 till 1912 with great ability. Among his numerous publications are: "Supposed Miracles," "Midnight Sun," "Czar and Nihilist," "Christian Science and Similar Phenomena," "Extemporaneous Oratory," "Constitutional and Parliamentary History of the Methodist Episcopal Church." He died in 1920.

BUCKNELL UNIVERSITY, a coeducational institution in Lewisburg, Pa.; organized in 1849, under the auspices of the Baptist Church; reported at the end of 1919: Professors and instructors, 39; students, 885; volumes in the library, 40,000; grounds and buildings valued at \$853,960; productive funds, \$561,075; president, Emory W. Hunt, LL. D.

BUCKNER, SIMON BOLIVAR, an American soldier and politician, born in Kentucky in 1823. He was graduated at West Point in 1840, and served in the Mexican War. He rose to distinction in the Confederate army during the Civil War, attaining the rank of Lieutenant-General. In 1896 he was nominated for Vice-President by the Gold Democrats, having previously served a term as Governor of Kentucky. He died in 1914.

BUCKRAM, a coarse textile fabric stiffened with glue and used in garments and bookbinding to give them or keep them in the form intended.

BUCKSHOT, a kind of leaden shot larger than swan-shot. About 160 or 170 of them weigh a pound. They are especially designed to be used in hunting large game.

BUCKSKIN, a kind of soft leather, generally yellow or grayish in color, prepared originally by treating deerskins in a particular way, but now in general made from sheepskins. This may be done by oil, or by a second method, in which the skins are grained, brained, and smoked.

BUCKTHORN, the English name of *rhamnus*, a genus of plants, the typical one of the order *rhamnaceæ* (rhamnads). The berries of the common species are black, nauseous, and, as the specific name *rhamnus catharticus* imports, highly cathartic; they afford a yellow dye when unripe, as the bark of the shrub does a green one. They are sold as French berries. The alder buck-

thorn, again, has dark purple purgative berries, which, in an unripe state, dye wool green and yellow, and when ripe bluish gray, blue, and green. The bark dyes yellow, and, with iron, black. Of the foreign species, the berries of the rock buckthorn, or *R. saxatilis*, are used to dye the Maroquin, or Morocco leather, yellow, while the leaves of the tea buckthorn, *R. thezans*, are used by poor people in China as a substitute for tea. The species best known to the pharmacopœia of this country is the *R. purshiana*, otherwise called *cascara sagrada*.

BUCKWHEAT, a plant, the *polyponum fagopyrum*. In the United States its flour is extensively used as a breakfast dish in the shape of buckwheat cakes. Its native country is Asia, where it is extensively cultivated as a bread corn. In Europe its flour is employed in the making of bread, cakes, etc., and its seeds for feeding horses and poultry. The total acreage in the United States for 1919 was 790,000, about 34,000 less than the 5 year average acreage (1913-1917), producing 16,301,000 bu. and valued at over \$24,000,000.

BUCKWHEAT TREE, the English name of *mylocarpum*, a genus of plants belonging to the order *ericaceæ* (heath-worts). The privet-like buckwheat tree, *mylocarpum ligustrinum*, is a native of Georgia.

BUCOLIC, a term derived from the Greek, "belonging to herdsmen," nearly equal to *pastoral*, from Latin. It is especially used of a kind of pastoral poetry. The great bucolic poets were Theocritus, Bion, Moschus; and Vergil's "Eclogues" are sometimes called *Bucolica*.

BUCYRUS, a city of Ohio, the county-seat of Crawford co. It is on the Sandusky river, and on the Columbus, Sandusky, and Hocking, the Toledo and Ohio Central, the New York Central, and the Pennsylvania railroads. It is the center of an important agricultural and stock-raising region. It has also important industries, including the manufacture of clay-working machinery, locomotive cranes, steam shovels, automobile and gas engines, plows, carriages and wagons, etc. The city has a handsome park, fine county buildings, a public library, and a hospital. Pop. (1910) 8,122; (1920) 10,425.

BUD, the name of bodies of various form and structure, which develop upon plants, and contain the rudiments of future organs, as stems, branches, leaves, and organs of fructification. Upon exogenous plants they are in their

commencement cellular prolongations from the medullary rays, which force their way through the bark. In general, a single bud is developed each year in the axil of each leaf, and there is one terminating the branch called a terminal bud. The life of the plant during winter is stored up in the bud as in an embryo, and it is by its vital action that on the return of spring the flow of sap from the roots is stimulated to renewed activity. Buds are distinguished into leaf buds and flower buds. The latter are produced in the axil of leaves called floral leaves or bracts. The terminal bud of a branch is usually a flower bud, and as cultivation is capable of producing flower buds in place of leaf buds, the one is probably a modification of the other.

BUDÆUS (bū-dē'us), (the Latinized form of GUILLAUME BUDE), a French scholar; born in Paris in 1467. His works on philology, philosophy, and jurisprudence display extensive learning, the two best known being the "De Asse et Partibus ejus" (1514), which contains a very thorough investigation into ancient coins, and the "Commentarii Linguae Græcæ" (1519), the basis of all subsequent works in this department. His abilities were manifested not only in literature, but in public business. Louis XII. twice sent him to Rome, and Francis I. also employed him in several negotiations. At Budæus' suggestion, Francis founded the Collège de France and the library at Fontainebleau, the basis of the Bibliothèque Nationale, and was also persuaded to refrain from prohibiting printing, which the bigoted Sorbonne had advised in 1533. He was royal librarian at the time of his death, Aug. 23, 1540.

BUDAPEST (bö'da-pest), the official name of the united towns of Pest and Buda, or Ofen, the one on the right, the other on the left, of the Danube, forming the capital of Hungary. Buda, which is the smaller of the two, and lies on the W. bank of the river, consists of the fortified Upper Town on a hill; the Lower Town, or Wasserstadt, at the foot of the hill, and several other districts. Among the chief buildings are the former royal castle and several palaces, the arsenal, town hall, Government offices, etc., and a very handsome Jewish synagogue. The mineral baths of Buda have long been famous, the Bruckbad and Kaiserbad having both been used by the Romans. Pest, or the portion of Budapest on the left or E. bank of the river, is formed by the inner town of Old Pest on the Danube, about which has grown a semi-circle of dis-

tricts — Leopoldstadt, Theresienstadt, Elisabethstadt, etc. The river is at this point somewhat wider than the Thames at London, and the broad quays of Pest extend along it for from 2 to 3 miles. Pest retains, on the whole, fewer signs of antiquity than many less venerable towns. Its fine frontage on the Danube is modern, and includes the new Houses of Parliament, the Academy, and other important buildings. The oldest church dates from 1500; the largest building is a huge pile used as barracks and arsenal. There is a well attended university, having, previous to the World War, over 7,500 students. There are also many other educational institutions, including a technical college, high, grammar, trade, and mercantile schools; and hospitals, and other charitable institutions. Its chief manufactures are flour, machinery, gold, silver, copper, and iron wares, chemicals, silk, leather, tobacco, etc. In recent years the city has become one of the flour milling centers of the world. A large trade is done in grain, wine, wool, cattle, etc. Budapest is strongly Magyar, and, as a factor in the national life, may almost be regarded as equivalent to the rest of Hungary. It was not until 1799 that the population of Pest began to out-distance that of Buda; but from that date its growth was very rapid and out of all proportion to the increase of Buda. In 1799 the joint

as its capital. The Government fell March 22, 1919, and was succeeded by a Soviet government under Bela Kun. A reign of terror ensued that was ended only when the Rumanians captured the city Aug. 3, 1919. (See AUSTRIA-HUNGARY; WORLD WAR.)

BUDAUN (bö-dä'-ön), a town of India in a district of the same name, United provinces, consisting of an old and a new town, the former partly surrounded by ancient ramparts. There is a handsome mosque, American mission, etc. Pop. 39,000.

BUDDHA (bö'dha), a man possessed of infinite or infallible knowledge; a deified religious teacher. There was said to be a series of them, a number having come and gone before Gautama, the personage described below. When no Buddha is on earth, the true religion gradually decays, but it flourishes in pristine vigor when a new Buddha is raised up. He is not, however, entitled at once to that honorable appellation; it is only after he has put forth arduous exertions for the faith that he attains to Buddhahood. Most of the Buddhas preceding the personage described below appear to have been purely fabulous. His immediate predecessor, Kasyapa or Kassapo, may have been a real person. The word is chiefly applied to a distinguished personage of Aryan descent, whose father



THE GREAT BUDDHA OF YUN-KANG

population of the two towns was little more than 50,000; since then it has grown very rapidly until now it is estimated at about 1,000,000. After the signing of the Austrian armistice, Hungary seceded from the Austrian Empire and established a republic with Budapest

was king of Kapilavastu, an old Hindu kingdom at the foot of the Nepaulese Mountains, about 100 miles N. of Benares. He was of the Sakhya family, and the class of the Gautamas, hence his distinguished son was often called Sakhya Muni, or Saint Sakya, and Gautama, or

Guadama. The Chinese call him Fo, which is the name Buddha softened in the pronunciation. The Aryan invaders of India looked down with contempt upon the Turanian inhabitants of that land, and, to keep their blood uncontaminated, developed the system of caste. Buddha, whose human sympathy was wide-reaching, broke through this old restraint, and, though he was himself an Aryan, preached the equality of races, a doctrine which the oppressed Turanians eagerly embraced. By the common account he was born in 622 B. C. attained to Buddhahood in 580, and died in 543, or, in the opinion of some, in 477 B. C. and other years than these, such as 400 B. C., or even lower, have been contended for. Buddha became deified by his admiring followers. Those images of an Oriental god made of white marble, so frequently seen in museums and in private houses, are representations of Buddha.

BUDDHISM, the system of faith introduced or reformed by Buddha. In its origin Buddhism was a reaction against the caste pretensions of the Brahmins and other Aryan invaders of India, and was, therefore, eminently fitted to become, as it for long was, the religion of the vanquished Turanians. As might have been anticipated, the equality of all castes was, and is, one of its most fundamental tenets. Another tenet is the deification of men, who, when raised to Buddhahood, are called Buddhas. Professors of the faith enumerate about 100 of these personages, but practically confine their reference to about seven. Pre-eminent among these stands Buddha himself. Personally, he never claimed divine honors. It was his disciples who first entitled him Sakhya Muni, *i. e.*, Saint Sakhya. As Gautama, though adored as superhuman, is, after all, confessedly only a deified hero, it has been disputed whether his followers can be said to admit a Supreme Intelligence, Governor of this and all worlds. In philosophy, they believe the universe to be a *maya*, an illusion or phantom. The later Brahminists do the same; but in the opinion of Krishna Mohun, Banergea, and others, these latter seem to have borrowed the tenet from the Buddhists rather than the Buddhists from them. Of the six schools of Hindu philosophy, those which Buddhism most closely approaches are the Sakhya philosophy of Kapila and the Yoga philosophy of Patanjali. Buddhism enjoins great tenderness to animal life. The felicity at which its professors aim in the future world is called Nirvâna, or, more accurately, Nibbanam. It has

been disputed whether this means annihilation or blissful repose. Robert Cæsar Childers, in his dictionary of the Pali language, uses strong arguments in favor of the former view. Buddhism was attended by an enormous development of monasticism.

The language in which Gautama or Buddha taught was the Mâgadî or Pali, the language of Magadha, now called Bahar or Behar. It was a Prâkrit or Aryan vernacular of a province, but has now been raised to the dignity of the Buddhist sacred tongue throughout the world. Gautama's followers believe that his sayings were noted down in the Tripitaka, or "Three Treasures of Discipline, Doctrine and Metaphysics," which constitute the Buddhist scriptures. What their real age is has been a matter of dispute; the discovery by General Cunningham, in 1874, of allusions to them in the "Bharput Sculptures," which are of date 3d century B. C., is in favor of their genuineness and antiquity. This work is in Pali; the Sanskrit Buddhist books discovered by Brian Hodgson in Nepaul are much more modern, and present a corrupt form of Buddhism.

The first general council of the Buddhist Church was held at Rajagriha, the capital of the Magadha kingdom, in 543 B. C.; the second at Vesal (Allahabad [?], or a place near Patna) about 443 B. C., or 377 (?), and a third at Pataliputra (Greek, Palibothra=modern Patna), on the Ganges, in 307 B. C. or 250. This last one was called by Asoka, an emperor ruling over a great part of India, who had been converted to Buddhism, and is sometimes called the Constantine of that faith, having established it as the state religion of his wide realm. He sent missionaries into western, central and southern India, and also to Ceylon and to Pegu. Buddhism was dominant in India for about 1,000 years after its establishment by Asoka. Then, having become corrupt and its vitality having decayed, reviving Brahminism prevailed over it, and all but extinguished it on the Indian continent, though a modification of it, Jainism, still exists in Marwad and many other parts. It has all along held its own, however, in Ceylon. On losing Continental India, its missionaries transferred their efforts to China, which they converted, and which still remains Buddhist. The religion of Gautama flourishes also in Tibet, Burma, and Japan, and is the great Turanian faith of the modern as of the ancient world. It is estimated that there are about 138,000,000 followers of Buddhism, practically all of whom live in Asia. There has sprung up, since II—Cyc

the latter part of the 19th century, a very extensive literature on the history, philosophy, precepts, and observances of Buddhism.

The Rev. G. Smith points out resemblances between Buddhism and Roman Catholicism (these, it may be added, were first discovered by the Jesuit missionaries, who were greatly perplexed by them): "There is the monastery, celibacy, the dress and caps of the priests, the incense, the bells, the rosary of beads, the lighted candles at the altar, the same intonations in the services, the same ideas of purgatory, the praying in an unknown tongue, the offerings to departed spirits in the temple." The closest similarity is in Lamaism, an amplification of Buddhism in Tibet. But most of the resemblances are ceremonial; there is no close similarity in doctrine between the two faiths.

BUDDHISM, ESOTERIC. See THEOSOPHY.

BUDDING, the art of multiplying plants by causing the leaf bud of one species or variety to grow upon the branch of another. The operation consists in shaving off a leaf bud, with a portion of the wood beneath it, which portion is afterward removed by a sudden jerk of the operator's finger and thumb, aided by the budding knife. An incision in the bark of the stock is then made in the form of a T; the two side lips are pushed aside, the bud is thrust between the bark and the wood, the upper end of its bark is cut to a level with the cross arm of the T, and the whole is bound up with worsted or other soft fastening, the point of the bud being left exposed. In performing the operation, a knife with a thin, flat handle and a blade with a peculiar edge is required. The bud must be fully formed; the bark of the stock must separate readily from the wood below it; and young branches should always be chosen, as having beneath the bark the largest quantity of cambium or viscid matter out of which tissue is formed. The maturer shoots of the year in which the operation is performed are the best. The autumn is the best time for budding, though it may also be practiced in the spring.

BUDDEA, or BUDDLEIA, a genus of plants belonging to the order *scrophulariaceæ* (figworts). The species are evergreen or deciduous shrubs from this country, Africa or Asia. *B. neemda* is one of the most beautiful plants in India. *B. globosa*, from Chile, is also highly ornamental. Fully 60 species of buddleia are known.

BUDGET, the annual statement relative to the finances of a country, made by the proper financial functionary, in which is presented a balance sheet of the actual income and expenditure of the past year, and an estimate of the income and expenditure for the coming year, together with a statement of the mode of taxation proposed to meet such expenditure.

BUDRUN, a seaport town of Asiatic Turkey, on the N. shore of the Gulf of Kos, about 96 miles S. of Smyrna. It is the site of the ancient Halicarnassus, the birthplace of Herodotus and Dionysius. Pop. about 6,000.

BUDWEIS (böd-vís', Czech BUDĚJOVICE), a town of Bohemia, Czechoslovakia, on the navigable Moldau, 77 miles S. of Prague. It has a cathedral with a detached belfry dating from about 1550, manufactures of stoneware, machines, lead pencils, beer, saltpeter; and trade in grain, wood, coals, and salt. Pop. about 45,000. In the neighborhood is Schloss Frauenberg (1840-1847), the seat of Prince Schwarzenberg.

BUEL, CLARENCE CLOUGH, an American editor and author, born at Laona, Chautauqua co., N. Y., July 29, 1850. He was connected with the New York "Tribune" from 1875 to 1881; from 1881-1914 successively assistant, associate, and advisory editor of "Century Magazine"; edited in conjunction with Robert Underwood Johnson, "Battles and Leaders of the Civil War" (4 vols., 1887).

BUELL, DON CARLOS, an American military officer, born near Lowell, O., March 23, 1818. He was graduated at West Point, in 1841, and served in the Mexican War. When the Civil War broke out he was adjutant-general of the regular army, and was made a Brigadier-General of Volunteers and attached to the Army of the Potomac. In November, 1861, he succeeded Gen. W. T. Sherman in command of the Department of the Ohio. He resigned from the volunteer service on May 23, 1864, and on June 1, following, also resigned his commission in the regular army. He was President of the Green River (Ky.) Iron Works from 1865 to 1870, when he engaged in coal mining. From 1885 to 1890 he served as United States Pension Agent at Louisville. He died near Rockport, Ky., Nov. 19, 1898.

BUENA VISTA, a village of Mexico, 7 miles S. of Saltillo, where, on Feb. 22-23, 1847, some 5,000 United States troops, under Taylor, defeated 20,000 Mexicans under Santa Anna.

BUEN-AYRE, French BONAIRE (bwān-ī-rā), a West Indian island, 60 miles from the coast of Venezuela, and 30 E. of Curaçao, like which it belongs to the Dutch. It produces timber, cattle, cochineal, and salt. Area, 95 square miles; pop. about 7,000.

BUENOS AIRES, the largest province of Argentina. It has an area of 117,807 square miles. The southern part is crossed by two mountain chains. With this exception the province consists of an extensive plain, for the most part treeless. The coasts are low and sandy. The chief rivers are the Paraná and the Rio Salado. The chief industry of the province is cattle-raising and the growing of cereals, and the interest in the former was greatly stimulated by the demand of meat products as a result of the World War. Wheat growing has developed in the province in recent years. There are over 3,000 miles of railway. Through its geographical position the province controls the foreign commerce of Argentina. The chief exports are wool, beef, and other animal products. The province is independent of the central government in its administration. The capital is La Plata. Pop. of the province in 1918 was 2,290,102.

BUENOS AIRES, the capital of Argentina and the largest city of the southern hemisphere. It has a population of 1,637,155 (1918). It is situated on the right bank of the La Plata river, twelve miles from its mouth. It extends eleven and a half miles from N. to S. and fifteen and a half miles from E. to W. The plan of the city is quadrangular. It is well paved and abounds with beautiful structures. The commerce of Buenos Aires vastly exceeds that of any city in South America. There are ten trans-atlantic lines of steamships which connect it with Europe, and railroad connections with Patagonia, Chile, and Bolivia. It has a harbor, largely artificial, that cost \$35,000,000 and covers an area of 165 acres, and twenty-four warehouses with the capacity of 24,000,000 tons of merchandise. Although Argentina is essentially a grazing and agricultural country, there are 10,350 industrial establishments in the capitol, employing about 119,000 workmen. The principal manufactures are chemical products, construction materials, hide products, furniture, carpets, and preserved foods. There are twenty-one banks in Buenos Aires with a combined capital of \$100,000,000. There are a number of branches of American and European banks. The annual clearings amount to \$3,000,000,000. There are 250 public schools with 3,000 teachers and an en-

rollment of 300,000 pupils. The university has about 4,700 students. There are several technical schools, normal schools, and business colleges. The public libraries hold 50,000 volumes. The city is governed on a commission plan, and the amount of annual expenditure is about \$100,000,000.

BUFFALO, city and county-seat of Erie co., N. Y., second city in population and importance in New York. It is built at the E. end of Lake Erie, at the head of the Niagara river, 20 miles above the Falls. It is the W. terminus of the Erie canal, and has a navigable water front of 8 miles, with numerous piers, breakwaters, basins and canals, giving it one of the finest harbors on the lakes and making it a great commercial center. The city is connected by several steamship lines with the chief lake ports, and by ferries with Victoria and Fort Erie, on the Canadian side. The International Bridge, costing \$1,500,000 and completed in 1873, connects Buffalo with these towns. Area, 42 square miles; pop. (1890) 255,664; (1900) 352,387; (1910) 423,715; (1920) 506,775.

Topography.—Buffalo is situated on an elevated plain, 50 feet above the lake and 600 feet above sea-level. From this plain the ground slopes gradually to the lake. It is bordered on three sides by water, the Niagara river, Lake Erie, and Buffalo river. Buffalo river is navigable for 2 miles, and two canals pass between the river and the lake. The city is noted for its wide and beautiful streets, and the abundance of shrubbery and trees decorating them. The principal streets are Main, Niagara, Delaware, Broadway, and Linwood and Elmwood avenues, 120 feet wide, and all over 5 miles in length.

Municipal Improvements.—The city owns an extensive waterworks system, costing \$9,000,000. The water is distributed through 600 miles of mains. The sewerage system has about 525 miles of pipe, and the sewage is carried off, by means of a tunnel, into the Niagara river. The city is lighted by gas and electricity. Much natural gas, piped from Pennsylvania and Canada, is used for heating and manufacturing purposes. There are more than 225 miles of street railways and a steam belt-line connects with the suburbs.

Public Parks.—Buffalo has an extensive park system. There are several attractive parks and squares in the business portions of the city, among them Lafayette, Niagara, and Franklin. Lafayette square contains the Soldiers' and Sailors' Monument, erected at a cost of \$50,000, and the Buffalo Library. A

portion of the Niagara river front rises in an abrupt bluff and is known as The Front. It affords a grand view in all directions and is the site of Fort Porter, where several companies of United States troops are stationed. The Parade Ground is one of the principal parks and contains 50 acres of land.

Notable Buildings.—The principal public buildings are the Federal Building, containing the Postoffice and Custom House, a large building of free-stone; the State Arsenal; the Board of Trade Building; the Old and New Armories; Grosvenor Library; Normal School; two public high schools; Erie County and Buffalo Savings Banks; the Erie County Penitentiary; and the City and County Hall. The latter is of granite with a tower 245 feet high, situated in Franklin street, completed in 1880 at a cost of about \$1,400,000. Besides these, there is the Buffalo Library, in Lafayette Square, containing a circulating library of 77,000 volumes, and, in the same building, are the Buffalo Historical Society, the Buffalo Fine Arts Society and School of Arts, and the Society of National Sciences. The State Insane Asylum has a plot of 203 acres and adjoins the Buffalo Park. Other notable structures are the numerous grain elevators. Buffalo is one of the greatest grain shipping cities of the United States and contains some of the largest grain elevators in the world. The first elevator in the world was built at Buffalo in 1843.

Commerce.—Buffalo has had an astonishing industrial growth. Its location at the eastern terminus of transportation on the Great Lakes has made it an important station on the highway connecting the growing West with the eastern seaboard. It is one of the world's greatest ports, and despite the fact that navigation on the Great Lakes is limited to about eight months of the year, the city stands eighth in tonnage among the ports of the world. Clearances are issued to 10,000 vessels annually. The grain receipts in 1919 totaled 93,627,867 bushels. Receipts of coal over water routes were 69,805 tons; copper, 52,501 tons; pig iron, 2,650 tons; merchandise, 113,937 tons; stone flux, 960,337 tons; iron ore, 4,837,981 tons; lumber, 16,374,708 feet. In addition to the foregoing, there is the tremendous tonnage of the railroads, operating twelve months in the year instead of eight, but for which only fragmentary statistics are available, it being impossible to obtain from the railroads the record which would make such a computation possible. Additional great quantities of grain are

received by rail, together with an enormous coal tonnage and miscellaneous freight amounting to millions of tons. Buffalo is also one of the country's most important live-stock markets, receipts for 1919 including 9,522 cars of cattle, 7,993 of hogs, 3,156 of sheep, 773 of horses, and 4,535 mixed cars. The importance of the city as a killing and packing center is seen in the comparison of the foregoing figures with the shipment from Buffalo for the same period, which amounted to 5,582 cars of cattle and 3,223 hogs. The stockyards are the second largest in the world. It is the first sheep market in the country and the second horse market. It is also the world's largest lumber market.

Manufactures.—As a manufacturing center, Buffalo ranks ninth among the cities of the United States. It is known as the "City of Diverse Industries," producing in quantities 58 per cent. of all the different lines of goods recognized by the U. S. Census Bureau. It is one of the most extensive producers of pig iron in the world, having over 20 large blast furnaces with a combined annual capacity of between 2,000,000 and 3,000,000 tons. It has the largest dye plant in the country. It produces one-third of the nation's linseed oil. There are 2,500 manufacturing plants employing 75,000 men and women. The principal industries are steel, pig iron, coke, flour, tanning, wall board, linseed oil, dyes, automobiles, rubber, benzol, cereals, lumber, copper, brass, leather, soap, and packing products.

Banking.—There are sixteen banks, with a combined capital of \$18,300,000, and surplus and profits amounting to \$20,332,427, with total deposits of \$245,766,717. The savings-banks deposits, Jan. 1, 1920, were \$126,247,413. The bank clearances for 1919 were \$1,655,366,659. There are 27 savings and loan associations.

Education.—There are 66 public schools, with an enrolment of 65,265 pupils, and 62 parochial schools, with an average attendance of 30,000. There are 5 high schools, 4 vocational schools, 1 training school, 1 normal school of practice, and 1 opportunity school. There are 2,700 teachers and employees. In addition, there are many night and vacation schools. Higher education is afforded by the University of Buffalo, Canisius College, and Holy Angels Academy. The public library has 400,000 volumes, and 4,500 pamphlets, and over 130,000 individual borrowers made use of its circulating department in 1919. The Grosvenor Library has 136,000 volumes. Other institutions are the Buffalo His-

torical Society, the Society of Natural Sciences, and the Buffalo Fine Arts Academy. The city has the largest night school attendance of any city of its size in the world.

Churches.—There are 260 churches in Buffalo, many of them with beautiful structures. Noteworthy edifices are Trinity (Protestant Episcopal), the First Presbyterian, and St. Joseph's Cathedral (Roman Catholic), which has the largest carillon in the United States and the third largest in the world. Hospitals and charitable institutions are the Buffalo State Hospital, Children's Hospital, Erie Hospital, General Hospital, Homeopathic Hospital, Lexington Heights Hospital, Providence Retreat, Riverside Hospital, and Women's Hospital; the Home for the Friendless, Orphan Asylum, St. Vincent's Orphanage for Girls, Church Home for Aged Women, St. Mary's Asylum for Widows and Foundlings, Home for Erring Women, State Asylum for the Insane, Fitch Institute, and St. Mary's Institution for Deaf Mutes.

Finances.—The funded debt of the city, June 30, 1920, was \$45,034,719. The total assessed realty valuation was \$608,175,115. The ratio of assessed valuation to market value was 100 per cent. There is an excellent police force numbering 800, and a fire department numbering 915. The total number of city employees including laborers was 7,865. There are more than 600 miles of paved streets. The mileage of street railways was 223.40 and the passengers carried annually were 191,200,048. There are 610 miles of water mains and 568 miles of sewers. The birth rate per 1,000 was 26.70 and the death rate 15.30.

Government.—The city is under the commission form of government, which went into operation Jan. 1, 1916. The commission consists of the mayor and four councilmen, and in these all executive, administrative and legislative power is vested. The term of office of each member is four years. The government of the city is divided into five major departments, designated as the Department of Public Safety; Department of Finance and Accounts; Department of Public Works; Department of Parks and Public Buildings, and Department of Public Affairs. The Mayor in 1920 was George S. Buck.

History.—The site of Buffalo was first visited by the French, under La Salle, in 1679. In 1687 a settlement was made by Baron La Honton and Fort Supposé was erected. It was held by the British as Fort Erie during 1783-1784, and was incorporated as the village of Buffalo and

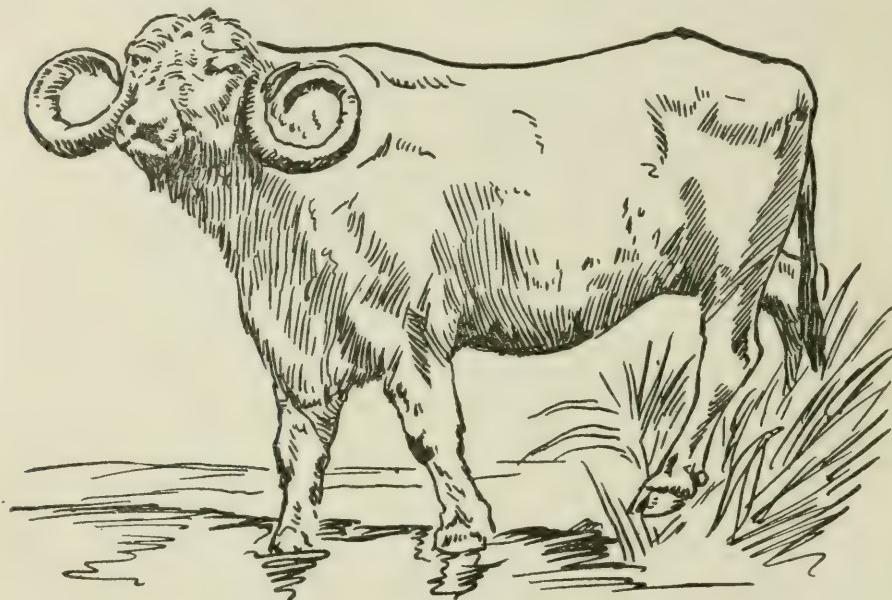
soon afterward burned by the British, in 1813. It was rebuilt in 1815; but its progress was slow until the completion of the Erie canal in 1825. It became a city in 1832 and since then it has been very prosperous. During 1901 the Pan-American Exposition was held in Buffalo. Here on September 6, Pres. McKinley was assassinated. The exposition was a brilliant affair, but not successful financially.

BUFFALO, a name often applied to two distinct bovine genera or sub-genera —viz., the Asiatic buffalo (*bubalus*) with the Cape buffalo; and the American buffalo, better named bison. The genus or sub-genus *bubalus* has the usual bovine characteristics, and, whatever be its exact limits in strict zoological classification, remains, for practical purposes, a large, clumsy ox. The horns rise from the posterior side corners of the skull, are usually thickened out of proportion at the base, and irregularly ridged, though smooth toward the points; the forehead is short and arched; the covering of hair is comparatively sparse. The common or Asiatic buffalo (*B. buffelus*) has beautifully twisted horns, thick and broad at the base, rough on to the middle, somewhat triangular in section. The horns lie back on the shoulders when the animal walks or runs, with its muzzle projecting characteristically forward. The hair is short and scanty, almost bristly, slightly longer on head, shoulders and front of neck, and all but black in color. The bare, brown, polished hide is, however, the more striking feature. The animal measures about 7 feet in length, and stands about 4 feet high at the shoulder. It is a native of the East Indies, has been domesticated in India, and thence introduced into Egypt, Greece, Italy, Hungary, etc. The buffalo is a very powerful animal, much more powerful than the ox, and capable of dragging or carrying a far heavier load. The female yields a much greater quantity of milk than a cow, and of excellent quality. It is from buffalo milk that the *ghee* or semi-fluid butter of India is made. The hide is greatly valued for its strength and durability, but the flesh is decidedly inferior to that of the ox. The Cape buffalo (*bos caffer*) is generally regarded as a distinct species. The horns are very large; they spread horizontally over the top of the head, and are then bent down laterally, and turned upward at the point. The head is carried, as by the common buffalo, with projecting muzzle and reclining horns, but the bases of the horns nearly meet on the forehead, where they are from 8 to 10 inches broad. The

length of a full-grown Cape buffalo is about 8 feet from the root of the horns to the tail, and the height is $5\frac{1}{2}$ feet. This animal is regarded as more formidable than any other in south Africa. The buffalo is still found in large herds in the marshy wooded regions of central and south Africa. It grazes chiefly in the evening, and lies in woods and thickets during the day. It will readily act on the aggressive, and has never been domesticated. The flesh, though coarse, is palatable. For the American buffalo, see BISON.

chiefly applied to railroad carriages, there being two at each end.

BUFF LEATHER, a strong oil leather, prepared from the hide of the buffalo, elk or ox. Formerly it was largely used for armor. It was said to be pistol-shot proof, and capable of turning the edge of a sword. It was tanned soft and white. Its place is now filled by the leather of cow skins for a common, and of the buffalo or bison of this country for a superior, article. It is still, however, much used in the saber, knapsack,



ASIATIC WATER BUFFALO

BUFFALO BERRY (*shepherdia argentea*), a shrub of the oleaster family, a native of the United States and Canada, with lanceolate, silvery leaves and close clusters of bright red acid berries about the size of currants, which are made into preserves and used in various ways.

BUFFALO BILL. See CODY, WILLIAM FREDERICK.

BUFFALO GRASS (*triplochiton dactyloides*), a strong growing North American grass, so called from forming a large part of the food of the buffalo, and said to have excellent fattening properties; called also gama grass.

BUFFER, a cushion or mechanical apparatus formed with a strong spring, to deaden the concussion between a body in motion and one at rest. Buffers are

and cartridge box belts of armies, as well as occasionally to cover the buffers and buff wheels of the cutler, lapidary, and polisher.

BUFFON (bö-fôn'), **GEORGE LOUIS LECLERC, COUNT DE**, a French naturalist, born in Montbard, Burgundy, Sept. 7, 1707. In 1739 he was appointed Superintendent of the Royal Garden at Paris (now the Jardin des Plantes) and devoted himself to the great work on "Natural History." It is now obsolete and of small scientific value, but it for long had an extraordinary popularity. After an assiduous labor of 10 years the three first volumes were published, and between 1749 and 1767 twelve others, which comprehended the theory of the earth, the nature of animals, and the history of man and the mammalia. The nine following volumes,

which appeared from 1770 to 1783, contain the history of birds. The five volumes on minerals were published from 1783 to 1788. Of the seven supplementary volumes, of which the last did not appear until after his death in 1788, the fifth formed an independent whole, the most celebrated of all his works. It contains his "Epochs of Nature," in which the author gives a second theory of the earth, very different from that which he had traced in the first volumes, though he assumes at the commencement the air of merely defending and developing the former. His works were translated into almost every European language. He died in Paris, April 16, 1788.

BUG, the English name of the sub-order heteroptera, one of two ranked under the order hemiptera or rhyncoptera. Most of the species essentially resemble the bed-bug, except that they have wings. Some suck the blood of animals, and others subsist on vegetable juices. Not a few species are beautiful, but many have the same unpleasant smell which emanates from the bed-bug. The unattractive form and manner of life of the bed-bug are too well known to require description. The eggs, which are white, are deposited in the beginning of summer. They are glued to the crevices of bedsteads or furniture, or to the walls of rooms. Before houses existed, the bug probably lived under the bark of trees.

BUG, the name of two Russian rivers. The western Bug rises in the Republic of Ukraine, near Lemberg, and after a course of about 470 miles, forming, for the most way, the E. frontier of Poland, it joins the Vistula, near Warsaw. The eastern Bug, the Hypanis of the ancients, rises in Podolia, Republic of Ukraine, and flows 520 miles S. E. into the estuary of the Dnieper. They both played an important part during the World War, and their banks and the adjoining regions saw much and very heavy fighting.

BUGBANE, a name given in this country to *cimicifuga*, a plant of the order *ranunculaceæ* (crowfoots). It is called in England bugwort.

BUGENHAGEN, JOHANN (bö'Gen-hä'gen), a German reformer, friend and helper of Luther in preparing his translation of the Bible, born in 1485. He fled from his Catholic superiors to Wittenberg, in 1521, where he was made, in 1522, Professor of Theology. He effected the union of the Protestant free cities with the Saxons and introduced into Brunswick, Hamburg, Lübeck, Pomerania, Denmark, and many other places, the Lutheran service and church discipline. He translated the Bible into Low German (Lübeck, 1533); wrote an "Exposition of the Book of Psalms" and a "History of Pomerania." He died in 1558.

BUGLE (*ajuga*), a palæarctic genus of *labiatæ*. The common bugle (*A. repens*) is abundant in moist pastures and woods of Europe. Its flowers are generally blue, but white and purplish varieties are sometimes grown in flower borders. *A. alpina* is one of the beautiful flowers of the Swiss Alps.

BUGLE, a treble instrument of brass or copper, differing from the trumpet in having a shorter and more conical tube, with a less expanded bell. It is played with a cupped mouthpiece. In the original form it is the signal horn for the infantry, as the trumpet is for the cavalry.

BUGLOSS, a popular name applied to a number of plants of the natural order *boragineæ*, and in particular to the *alkanet*.

BÜHL, or **BOULLE**, unburnished gold, brass, or mother of pearl, worked into patterns for ornamenting furniture. Set as an ornament into surfaces of ebony or dark wood, or tortoise shell.

BUHR STONE, a variety of quartz containing many small, empty cells, which give it a peculiar roughness of surface. They are used principally as millstones. The best kinds are creamy white, with a granular and somewhat cellular texture, and are obtained in the Tertiary formation of the Paris basin, and chiefly at La-Ferté-sous-Jouarre. They are cut into wedge-shaped parallel-pipeds, called panes, which are bound together with iron hoops to form large millstones. Numerous substitutes for the French buhr stone have been found in the United States, the most important being furnished by the buhr stone rock of the bituminous coal measures of northwestern Pennsylvania and eastern Ohio; but they cannot compete with the French rock.

BUILDING AND LOAN ASSOCIATIONS, combinations of individuals, who agree to pay a fixed sum monthly, by which a fund is accumulated which is loaned to members who desire to purchase or improve real estate. Their capital stock, which is prospective, is usually divided into shares of a par value of \$200 each. Each shareholder pays upon each share he holds a monthly subscription of \$1, till such payments, with ac-

crued profits, bring the value of the share to par. The number of shares each member may hold varies in different associations, the general rule being not less than two nor more than 25, the latter limitation being intended to prevent speculation. Building and loan associations are formed on two plans, called terminal and serial. The terminal associations compel all members to begin payments on the same day. A new member joining after the beginning of the association is thus forced to pay arrearages. This is avoided in serial associations by allowing new members to join at stated intervals, usually six months or a year, without the payment of arrearages. The advantages of building and loan associations are: That each share, whether borrowed upon or not, has credited to it a pro rata amount of all profits declared. Loans are generally advanced to within 80 per cent. of the appraised value of the property. No large salaries are paid. All officers, appraisers, auditors, etc., are elected in open meeting. Members may withdraw at any time after the first year, obtaining a fair share of the profits. Loans are invariably secured by first mortgage. Only members may obtain loans. Mortgages may be paid off at any time. There are no speculative features, the association buys nothing, the borrowing member making all contracts. In 1918 there were 7,484 building and loan associations in the United States, reporting 4,011,401 shareholders. These associations had assets aggregating \$1,898,344,346. The total receipts and disbursements balanced at \$1,325,313,352.

BUILDING STONE, any stone used in the construction of buildings. The stones mostly employed are granite, sandstone, limestone, marble, serpentine, and trap. In order that a stone may be used to advantage for building purposes, it must possess certain physical and chemical properties; these are durability, permanency of color, crushing strength, elasticity, and cheapness. Stones vary greatly in their durability, depending upon their chemical composition, and the purposes for which they are used. As soon as a stone is quarried, it becomes exposed to changes in temperature, causing expansion and contraction of its particles and ending ultimately in its disintegration; to the chemical action of rain and atmosphere; and to frost and various mechanical forces, all tending to weaken it.

Granite.—The best building stones are those which have a compact formation, are not susceptible of chemical changes, and are easily worked. Granite comes

nearest to perfection in this line. It is the strongest stone in use, and, having been employed for ages, is found to withstand severer tests than any other stone. It is a very hard silicious rock, having a massive and granular crystalline structure, containing the minerals quartz, feldspar, mica, hornblende, and, occasionally, a little iron. The general color is gray, due to the presence of black mica or hornblende in the white quartz and feldspar. The red and pink varieties are caused by the presence of a red feldspar. The greatest granite beds in the United States are found in Maine and Massachusetts. These granites are chiefly gray. A large amount of red granite is quarried in Nova Scotia, Scotland, and Sweden.

Limestone.—Next to granite, the most durable building stones are the limestones. These vary greatly in both structure and color. One of the best varieties of this stone is the Indiana limestone. It has a white, or cream color, is of fine granular structure, and is readily worked. Many of the largest buildings in New York and Chicago are built of this stone. One of the best English building stones is the dolomite, or magnesian limestone of the Permian formation, which ranges from Nottingham to Tynemouth. It is a double carbonate of lime and magnesia, containing a varying proportion of silica. The Houses of Parliament are built of this dolomite, which unfortunately decays rapidly under the influence of the London atmosphere.

Marble.—Marble is a purer grade of limestone, of a finely crystallized structure. It is composed almost entirely of calcium carbonate. Its color varies from a pure white to a black, and it often occurs with a red, yellow, or brown color. These colors are due to the presence of carbonaceous matter and iron oxides. Marbles occur in the United States in the beds of the Silurian limestone, which border the Appalachian Mountains, and also in the Rocky Mountains. The best grades are quarried in Vermont, and a very good marble for building use is found in western Massachusetts and in Connecticut. In Europe, the principal sources of marble are northern Italy, France, Spain, and Portugal. The Numidian marble from Algeria has a great international reputation.

Sandstone.—Sandstones are composed of consolidated sand, and vary in color, structure, and composition. They are, as a rule, composed principally of quartz. The other substances they contain are chiefly carbonate of lime, alumina, and oxide of iron. In color, they vary from a gray, through buff and red, to brown;

this coloration being due to the presence of iron as an oxide or carbonate. The sandstones mostly used in the United States are the Ohio freestones, or Berea grits, from the Subcarboniferous formation of Ohio, and the red and brown freestones of Triassic formation on the Atlantic coast. A blue-gray sandstone, containing a large amount of alumina, occurs in New York State, and, on account of its thin stratification, it is split in slabs and used for flagging purposes.

Serpentine.—This stone is composed of silica and magnesium in about equal portions. It is a greenish color and of massive structure. It is rather soft, and is not very durable; but is used to a large extent in interiors and in the trimmings of churches and other places where a pleasing color effect is desired.

Trap.—Trap, or basalt, is one of the most durable stones known; but, on account of its extreme hardness, is little used in building. It is of igneous origin, and will withstand great changes in temperature and extreme frost. It ranges from gray to black in color, is massive in structure, very heavy, and of irregular cleavage. It occurs in almost all parts of the world.

Besides these commoner stones, many others are employed for interior and ornamental work, among them various colored slates, onyx, alabaster, and a great variety of artificial stone, brick, and tile.

Government reports estimate the value of the best known building stones quarried in the United States during 1918 as follows:

Granite	\$14,360,000
Limestone	39,000,000
Marble	5,500,000
Sandstone	4,360,000
Trap Rock	7,430,000
Miscellaneous	990,000
Total	\$71,640,000

UITENZORG ("without care"), a favorite residential town in the island of Java, about 40 miles S. of Batavia, with which it is connected by rail. It contains a fine palace of the governor-general, celebrated botanic gardens, etc. Pop. about 25,000.

BUKOWINA, a former Crownland of Austria-Hungary, bounded on the N. by eastern Galicia, on the E. by Russia and Rumania, on the W. by Hungary, and by Rumania on the S. It has an area of 4,030 square miles and a population of about 800,000. Its capital is Czernowitz (pop. about 90,000). It was the scene of severe fighting during the World War and after the conclusion of the conflict was claimed by Rumania on racial and political grounds. It is chiefly an agricultural country and has

considerable mineral resources. Since the end of the World War it has been under Rumanian rule.

BULACAN, a town in Luzon, Philippine Islands, in the province of the same name (area 1,173 square miles; pop. about 225,000), about 22 miles N. W. of Manila, with which it is connected by railway; pop. about 15,000. The town has factories in which silk matting is made. Sugar boiling is also an industry of importance.

BULAWAYO, the principal town and chief commercial center of Matabeleland, in southern Rhodesia, south Africa. It is connected by railroad with Cape Town and other parts of south Africa, to which point the railroad from Cape Town was completed in 1897, a total distance of 1,360 miles. The place has a white population of about 5,000; several hotels, good business blocks and residences, and is rapidly growing in size and importance.

BULB, a scaly body, formed at or beneath the surface of the ground, sending roots downward from its lower part and a stem upward from its center. It propagates itself by developing new bulbs in the axils of the scales, of which it is formed. There are two kinds of bulbs: (1) A tunicated bulb, literally a coated bulb, that is, a bulb furnished with a tunic or covering of scales, the outer series of which is thin and membranous, example, the onion; and (2) a naked bulb, or one in which the outer scales are not membranous and united, but distinct and fleshy like the inner ones; example, the lilies. The so-called solid bulb of the crocus is, properly speaking, not a bulb at all, but an underground stem with buds upon it, technically called a corm, whereas a proper bulb is analogous not to an underground stem, but to a bud only. Bulbs placed in water tend to rot; they flourish best when fixed in very light soil or even in the air an inch above water, into which their roots enter. They should have abundance of light.

BULBUL, the Indian name of any bird belonging to the *pycnonotinae*, a sub-family of *turdidae*, or thrushes. The bulbuls are admired in the East for their song, as are the nightingales. Some species are found in Africa. *P. jocosus*, which can be easily tamed, is kept for this end, and *P. haemorrhouus* for fighting purposes.

BULGARIA, a kingdom of southeastern Europe, bounded on the N. by the Danube and Rumania, on the S. by Turkey and the Ægean Sea, on the E.

by the Black Sea, and on the W. by Serbia and Greece. Before the World War it had an area of 43,320 square miles and a population of 4,467,000 people, made up chiefly of Bulgarians, but including also Turks, Rumanians, Greeks, Serbs and other nationalities. The capital is Sofia, with a population of 103,000.

Commerce and Finances.—Seventy per cent. of the people are engaged in agriculture, and the majority of them are small freeholders. The chief product is wheat, though fruits and vegetables are very abundant and roses are cultivated for the production of the attar of roses, which forms an important article of commerce. Tobacco is also raised and wine is produced in large quantities. There are many coal mines and stone quarries. The principal industries are carpets, hosiery, woolen and cotton goods and ribbons. In the year preceding the war the total state revenue was \$51,399,000 and the national debt \$231,496,540. The imports in 1914 were valued at \$44,586,860, the exports \$28,813,372.

Government.—The government is a constitutional monarchy. King Boris III., who acceded to the throne Oct. 4, 1918, is the present ruler. Legislative authority is vested in a single chamber whose representatives are chosen at the rate of one to every twenty thousand of the population. Men over thirty are eligible as members. Elections are held every four years. There is a cabinet of eight members appointed by the king.

Religion.—The national religion is that of the orthodox Greek church, but is not organically connected with that body. Twenty-five per cent. of the population are Mohammedans, Jews, Roman Catholics, Protestants, and Armenians while the remainder belong to the national church. Education is free and compulsory, and the university of Sofia, the chief institution of the kind in the kingdom, is coeducational. For so small a nation there are a creditable number of technical schools, museums, and free libraries.

History.—The Bulgarians were originally of Tartar origin. Their settlement on the Volga dates back to the 4th century. On the adoption of Christianity in the 9th century the Slavic and Tartar elements were amalgamated into the one race of Bulgarians. In 1018 Bulgaria fell under the control of the Byzantine empire. She regained her independence for a short period in the 12th and 13th centuries, but in 1390 was conquered by the Turks. The atrocities of the latter in 1876 provoked

an insurrection which led to the Russo-Turkish war, at the conclusion of which Bulgaria was made a separate principality, although still subject in a limited degree to Turkey. Alexander of Battenberg, a German prince, was made sovereign of Bulgaria, but, after a stormy reign and a war with Serbia, was compelled to abdicate Sept. 9, 1886. His successor was Prince Ferdinand of Saxe-Coburg-Gotha, who assumed the throne July 7, 1887. He inaugurated a strong anti-Russian policy, which was dictated largely by hatred of Serbia. In 1912-1913 Bulgaria, in connection with other Balkan states, made war on Turkey, but as a result of quarrels between the members of the confederacy Bulgaria was shorn of a large part of the territory which she claimed as the spoils of war. (See BALKAN WARS.) This left her sullen and resentful and was a moving cause of her entry into the World War on the side of the Central Powers.

Bulgaria formally entered the World War Oct. 5, 1915. For many months previous her adhesion had been sought by both parties to the conflict. Each had made her substantial offers of territorial and other advantages. For some months prior to the actual declaration of war it had been evident that the offers of the Teutonic Powers outweighed those of the Entente, and, as a matter of fact, a secret treaty had been signed between Bulgaria, Germany, Austria, and Turkey about July 17, 1915. Soon after this, Bulgaria began mobilizing, and Serbia, who had no doubt as to what the mobilization portended, asked permission of her Allies to attack Bulgaria at once and thus gain the advantage of the initial onset. This permission was refused, on the tenuous hope that Bulgaria might at least be held to neutrality. By October 3, however, the presence of German and Austrian officers in the Bulgarian War Ministry and army—the financial support being accepted from the Central Powers—and the concentration of Bulgarian troops in the zone bordering on Serbia so clearly foreshadowed the country's ultimate action that Russia addressed an ultimatum to the Bulgarian Government, giving it twenty-four hours to declare its intentions. The latter accepted the challenge defiantly and promptly moved against Serbia. At the same time it issued a manifesto to its own people declaring that Germany was certain to win the war and that it behooved Bulgaria to be on the side of the victors. The aims of the Entente were declared to be purely selfish and antagonistic to Bulgaria's interests. Russia, it stated,

was in the war to rob Turkey of the Dardanelles and Constantinople; France sought to regain Alsace-Lorraine; England wished to ruin Germany because she was jealous of the latter's commercial expansion; Italy, Serbia, and Montenegro were only seeking plunder. The Central Powers, on the other hand, it was asserted, were "only fighting to defend property and assure peaceful progress." "Therefore," the manifesto concluded, "we shall fight the Serbs at the same time as the brave armies of the Central Empires."

On October 12 Bulgaria declared war on Serbia. Three days later, Great Britain declared war against Bulgaria and was followed by the other Allies. Later, when America declared war on Austria and Germany, the question was raised why Bulgaria had not been included. The answer was that the Bulgarians were fighting only in what they regarded as Bulgarian territory, that the theater of operations was so circumscribed that Bulgarians were unlikely ever to face American troops, and that, despite the German demand that she should break with the United States, Bulgaria had refused to do so.

The Bulgarian military operations are treated in detail in the article on the WORLD WAR (*q. v.*) and need to be alluded to but briefly here. Her initial efforts in co-operation with the Teutonic forces of Von Mackensen resulted in the driving of the Serbs into Greece and the subjugation of Serbia. In the early part of 1916 the Bulgars held the Midji Mountains on the W. and the Belashitza Mountains on the E. and commanded the Vardar Pass. They had also encroached to some extent on Greek territory at Monastir. In the autumn of the same year they were signally defeated by the Franco-Serbian forces at Monastir and Florina. From that time on until the autumn of 1918 the hostile armies on the Macedonian front were practically deadlocked, each occupying positions of great natural strength and neither feeling strong enough to take a decided offensive. In September, 1918, a brilliant campaign was inaugurated by the Allied forces under the command of Franchet d'Esperey. In the Lake Doiran region, the British and Greek troops attacked the enemy's right, while the French and Serbians broke through the Bulgarian center on the Czerna river. At the same time the Italians struck heavily on the left, where the line extended into Albanian territory. By September 23 the First Bulgarian army had been separated from the Second and was in wild flight. The next day the Second army was in full retreat, and

the defeat ended in a debacle. Desperate appeals for aid brought no help from Germany, who was herself reeling under the Allied blows on the western front. Steps were taken looking toward an armistice, and this was signed on September 29, going into force at noon of September 30. King Ferdinand abdicated and was succeeded, Oct. 4, 1918, by his son, Boris III.

The treaty of peace between the Allied and Associated Powers and Bulgaria was presented to the delegates of the latter on Sept. 19, 1919, at Paris. Twenty-five days were given for consideration of its terms and the filing of objections or counter-proposals, after which a final date would be set for signature. In some respects the same lines were followed as that in the German treaty, especially as regards the League of Nations Covenant, penalties, prisoners of war, graves, labor, and aerial navigation. Changes were made in the former Bulgarian frontier to the south, where Bulgaria lost Thrace, while Serbia gained some slight advantages on Bulgaria's western frontier. The vanquished nation was obliged to recognize the independence of the Serb-Croat-Slovene state. Provision was made for the protection of racial and religious minorities. Fifty thousand tons of coal were required to be delivered annually for a period of five years to the Jugoslavic state, in compensation for the destruction of Serbian coal mines. Universal military service was abolished and voluntary enlistment substituted. The Bulgarian army was reduced to 20,000 men within three months from the date of signing. Only one military school was permitted to exist. The importation or exportation of arms, munitions, and war materials of all kinds were forbidden, and the manufacture of war material was confined to a single factory. All warships, including submarines, were to be yielded up to the Allies. As reparation Bulgaria was to pay \$445,000,000 in gold in semi-yearly payments. It was recognized that this amount was not adequate to cover the loss and damage suffered by the Allies from Bulgaria's participation in the war, but account was taken in fixing the sum of Bulgaria's ability to pay. An Inter-Allied Commission was to be established at Sofia as soon as possible after the coming into force of the treaty to supervise the carrying out of the terms. The cost and expenses of the commission were to be paid by Bulgaria and be a first charge on her revenues. The treaty was signed at Neuilly, near Paris, Nov. 27, 1919, accompanied by a protest on the part of the Bulgarian delegates,

who claimed that the principle of self-determination was violated by the territorial provisions.

BULKHEAD, a partition made across a ship, whereby one part is divided from another; also, a wood or stone construction designed to prevent earth or water from falling or flowing into the space protected by a bulkhead. A bulkhead line is a line a given distance from the shore, beyond which it is not permissible to build a dock, according to the rules of the War Department at Washington.

BULKELEY, MORGAN GARDINER, American statesman; born at East Haddam, Conn., Dec. 26, 1838. He was educated at the Hartford high school; was for several years a merchant in Brooklyn, and served in the 13th N. Y. Regiment during the Civil War. Returning to Hartford in 1872, he organized and was first president of the United States Bank there. He became president of the Aetna Life Insurance Company in 1879; was mayor of Hartford from 1880 to 1888; and from 1889 to 1893 was Governor of Connecticut. In 1905 he was elected United States Senator and served until 1911.

BULL, the male of any quadruped of the *bovidæ* family. Also, a sign of the zodiac: Taurus.

BULL, an instrument, edict, ordinance, or decree of the Pope, equivalent to the proclamations, edicts, letters patent, or ukases of secular princes. Bulls are written on the wrong side of parchment, to which a leaden seal is affixed, and are granted for the consecration of bishops, the promotion to benefices, and the celebration of jubilees, etc. The publication of papal bulls is termed fulmination; and it is done by three commissioners, to whom they are usually addressed. Bulls are generally designated by the first words of their text; thus, the *B. Unigenitus*, or *In Cena Domini*, etc.

GOLDEN BULL is the term particularly applied to a statute or enactment of the Emperor Charles IV., published in 1356, in two diets held in succession at Nuremberg and Metz, for the purpose of fixing the laws in the election of the Emperor, and of regulating the number and privileges of the electors (*Churfürsten*). The original copy of this instrument is preserved at Frankfort-on-the-Main, and has a seal of gold appendant; whence the appellation "golden bull" is derived.

BULL, JOHN, the popular sobriquet or characteristic name applied to the English nation.

BULL, OLE BORNEMANN, a Norwegian violinist, born in Bergen, Feb. 5, 1810. He secured great triumphs both throughout Europe and in the United States by his wonderful playing. He lost all his money in a scheme to found a colony of his countrymen in Pennsylvania, and had to take again to his violin to repair his broken fortunes. He afterward settled in Cambridge, Mass., and had also a summer residence in his native city, where he died, Aug. 17, 1880.

BULLACE, the English name of a tree, the *prunus communis*, variety *insititia*. It is akin to the variety *spinosa* (the sloe), but differs in having the peduncles and under side of the leaves pubescent and the branches slightly spinous, whereas the *spinosa* has the peduncles glabrous, the leaves ultimately so also, and the branches decidedly spinous.

BULLÆ, miniature blisters, or blebs. They are larger than vesicles, with a large portion of cuticle detached from the skin and a watery transparent fluid between. The skin beneath is red and inflamed.

BULLARD, ROBERT LEE, an American army officer; born at Youngsboro, Ala., in 1861. He graduated from West Point Military Academy in 1885. He served in Cuba and the Philippines. In 1917 he was made major-general, and



GEN. R. L. BULLARD

in January, 1918, was appointed Commander of the First Division of the A. E. F. in France. He distinguished himself in the campaigns of 1918 at St. Mihiel and in the Argonne, where he commanded the American Second

Army. For his services he was raised to the rank of lieutenant-general. At the end of the World War he was made a major-general in the regular army. He received the D. S. M. and various foreign decorations.

BULLARD, WILLIAM HANNUM GRUBB, an American naval officer, born in Media, Pa., in 1866. He graduated from the United States Naval Academy in 1886. In 1888 he was appointed ensign and rose through the various grades, becoming commander in 1909, and captain in 1912. He served during the Spanish-American War. From 1907 to 1911 he was at the United States Naval Academy, where he organized the department of electrical engineering. He was superintendent of the naval radio service from 1912 to 1916. During the World War he served in the Atlantic Fleet and in the American division of battleships in the British Grand Fleet. He commanded the United States naval forces in the eastern Mediterranean after the armistice, and was a member of the Inter-allied Commission to put into effect the naval terms of the armistice with Austria-Hungary. He received the surrender of the Austro-Hungarian fleet. From 1919 he was director of naval communications. He was the author of "Naval Electricians' Textbook," and many others on naval subjects. He acted as a delegate to many conferences on radio and other electrical subjects in foreign countries.

BULL BAITING, the barbarous sport of setting dogs on a bull, who is tied to a stake and worried by the dogs for the amusement of the spectators. It was a favorite sport in England from a very early period, till it was finally put down by Act of Parliament in 1835.

BULL DOG, a variety of the common dog, *canis familiaris*, variety *taurinus*, sometimes called variety *molossus*, from Molossia (southern Epirus or lower Albania), where similar dogs are said anciently to have existed. The bull dog has a thick, short, flat muzzle, a projecting under jaw, thick and pendent lips, a large head, a flat forehead, a small brain, half-pricked ears, a thick and strong body, but of low stature. Its courage and tenacity of hold are well known.

BULLEN, FRANK THOMAS, an English author, born in Paddington, London, April 5, 1857. His early education was scanty, and after acting as errand boy with various mercantile firms, he embarked in 1869 as an ordinary seaman,

soon rising to the position of chief mate. In 1883 he abandoned the sea, and became a clerk in the English meteorological office, a position which he held until 1889. He wrote some short sketches bearing on seafaring life, and they were so extraordinarily vivid and interesting and were so pervaded with the very breath of the sea that he soon achieved a reputation with publishers and the reading public. Among his numerous writings may be mentioned "The Cruise of the Cachalot" (1898); "The Log of a Sea Waif" (1899); "With Christ at Sea" (1901); "Deep Sea Plunderings" (1901); "A Whaler's Wife" (1902); and "The Call of the Deep" (1907). He died at Madeira in 1915.

BULLET, a ball, generally of lead, made to fit the bore of a rifle, pistol, or similar weapon, and designed to be propelled thence with great force as an offensive instrument or weapon. Bullets are now usually cylindrical, with conical or conoidal points.

BULL FIGHT, a barbarous amusement of great antiquity, having been practiced by the Egyptians, by the Thessalians, and others, but now associated chiefly with Spain, into which it seems to have been first introduced by the Moors.

BULL FINCH, a well known bird, the *pyrrhula vulgaris*, locally known as the norsk-pipe, the coal-hood, the hoop, or the tony hoop, the alp, and the hope. In the male the head, the part surrounding the bill, the throat, and the tail are lustrous black; the nape, the back and the shoulders bluish gray; the cheeks, neck, breast, the fore part of the belly and the flanks red; the rump and the vent white. A pinkish white bar runs transversely across the wing. Its length is about 6 $\frac{3}{4}$ inches. The female is less brightly colored. It feeds on pine, fir, and other seeds, on grain, on berries, on buds, etc. Its nest is usually of moss, the eggs, generally four, bluish white, speckled and streaked with purplish or pale orange brown at the thicker end. Its song is much prized. It is often domesticated. It is found in many lands.

BULL FROG, any frog which croaks with a deep rather than a sharp sound. A species of frog (*rana pipiens*) found in eastern North America, which has a voice not unlike that of a bull. It is six or eight inches long, by three or four broad, without the legs. It swallows fishes and even ducklings and young goslings whole. It is difficult to catch from its length of leap, besides which it

is generally left unharmed because it is said to purify rather than to pollute the waters in which it lives.

BULLHEAD, various fishes having large heads. The river bullhead, a spiny finned fish, *cottus gobio*. It is called also the miller's thumb and the tommy lugge. It has a broad and flat head, the preopercle with one spine, the body dusky clouded with yellow, the belly whitish. Its length is about four inches. The bullhead in this country is confounded with the catfish. The fish genus *aspidophorus*, of the same family *triglidæ*. *A. europæus* is the armed bullhead.

BULLION, uncoined gold and silver in bars or in the mass. United States standard bullion contains 900 parts of pure gold or pure silver, and 100 parts of copper alloy. The coining value of an ounce of pure gold is \$20.67183, and the coining value of an ounce of standard gold is \$18.60465. The coining value in standard silver dollars of an ounce of pure silver is \$1.2929, and the coining value of an ounce of standard silver is \$1.1636.

BULL RUN, or **BULL'S RUN**, a stream in Virginia, dividing Fairfax and Prince William counties, in the N. E. part of the State, and flowing into the Occoquan river 14 miles from the Potomac. On its banks were fought two of the most memorable battles during the Civil War. After a series of heavy skirmishes, July 16-19, 1861, the Union army under General McDowell was, on the 21st, utterly routed by the Confederates under the command of Generals Beauregard and J. E. Johnston. The Union loss was about 3,000 men, while that of the Confederates was estimated at nearly 2,000 men. The former lost, in addition, 27 guns, besides an immense quantity of small arms, ammunition, stores, provisions, and accouterments. On Aug. 30, 1862, another great battle was fought here between the Union forces commanded by General Pope, and the Confederates under Generals Lee, Longstreet, and "Stonewall" Jackson, when the former were again defeated with heavy loss. The three battles of Groveton, Bull's Run, and Chantilly, fought in three successive days, cost the Union cause about 20,000 men in killed, wounded, missing, and prisoners, 30 guns, and 30,000 small arms. The first battle of Bull Run is sometimes known as the battle of Manassas.

BULL TERRIER, a variety of dog, a cross breed between the bull dog and terrier.

BULL TROUT, an English name for *salmo eriox*, called also the gray trout, and the round tail. It is a British fish.

BÜLOW, **BERNHARD, PRINCE VON**, German statesman; born at Klein Flottbeck, Holstein, in 1849. He was educated at Lausanne, Leipsic, and Berlin; studied law, and took part in the Franco-Prussian War, rising to the rank of lieutenant, after which he entered the diplomatic service. He was successively secretary of legation at Rome, St. Petersburg, and Vienna, and became chargé d'affaires at Athens during the Russo-Turkish War, subsequently acting as secretary at the Berlin Conference in



PRINCE BERNHARD VON BÜLOW

1878. In 1888 he was appointed minister to Rumania, and ambassador to Italy in 1893; but was called back to Berlin in 1897 to hold the portfolio of foreign affairs. His skillful management of the Samoan difficulty increased his reputation as a statesman, and two years later he concluded a treaty with Spain, by which Germany secured the Caroline, Pellew, and Ladrone islands, upon which he was raised to the rank of count. In the complications with China he carried out the foreign policy of the Emperor. On the resignation of Prince Hohenlohe in 1900, he was nominated Chancellor of the German Empire and Prime Minister of Prussia. In 1905 his strenuous policy in regard to Morocco caused the fall of M. Delcassé, the French foreign minister, and nearly precipitated a European

war. This was, however, avoided by the meeting of the conference at Algeciras. He married the stepdaughter of the Italian premier Signor Minghetti, Princess Camporeale. In 1905 he was raised by the Emperor to the rank of prince. In his home policies, he showed considerable skill in combating the radical elements and keeping the reins of power in the hands of the conservatives, but in 1909 he was forced to resign because of the failure of his budget proposals. During the World War he played no conspicuous part, although it was understood that he was engaged in secret intrigues to separate Italy from her Allies, after having failed in a special mission to Rome in 1915, sent for the purpose of keeping Italy from entering the war on the side of the Allies. He wrote "Imperial Germany" (1914).

BÜLOW, HANS GUIDO VON, a German pianist and composer, born in Dresden, Jan. 8, 1830; was intended for a lawyer, but adopted music as a profession. He studied the piano under Liszt, and made his first public appearance in 1852. In 1855 he became leading professor in the Conservatory at Berlin; in 1858 was appointed court pianist; and in 1867 he became musical director to the King of Bavaria. In 1857 he married Cosima, daughter of Liszt who, in 1869, left him to become the wife of Richard Wagner. His compositions include overture and music to "Julius Cæsar," "The Minstrel's Curse," and "Nirvana," songs, choruses, and piano-forte pieces. He was considered one of the first of pianists and orchestral conductors. He died in Cairo, Feb. 13, 1894.

BULRUSH, or BULLRUSH, a name sometimes given to the botanical genus *typha*, called also cat's tail or reed mace. It is also the name of the genus *scirpus*, called also clubrush. Especially used of the species *scirpus lacustris*, lake clubrush. The bulrush of Scripture is the translation of two distinct Hebrew words, *agmon*, possibly an arundo or some similar genus, in Isa. lviii: 5, and *gome*, evidently the *papyrus nilotica* (Ex. ii: 3, Isa. xviii: 2).

BULWER, HENRY LYTTON EARLE (LORD DALLING), an English author and diplomatist, brother of Sir Edward Bulwer-Lytton, born Feb. 13, 1801; was minister to Madrid in 1843; in 1849 had a diplomatic mission to Washington, and was one of the negotiators of the BULWER-CLAYTON TREATY (q. v.); was ambassador to Turkey in 1858-1865. Among his works are "An Autumn in Greece" (1826); "France, Social, Liter-

ary, and Political" (1834-1836); and "Life of Byron" (1835). He died in Naples, May 23, 1872.

BULWER-CLAYTON TREATY, a treaty negotiated at Washington, D. C., in April, 1850, by John M. Clayton, Secretary of State under President Taylor, and Sir Henry Bulwer, British Minister to the United States. The treaty provided that neither the United States nor Great Britain should attempt to control a proposed canal across Nicaragua. The treaty provided further for the neutrality of the canal, and it guaranteed encouragement to all lines of interoceanic communication. The terms of the treaty were afterward much disputed. In 1882 the United States Government intimated to Great Britain that the canal having become impracticable because of reasons for which Great Britain alone was responsible, the United States considered the treaty as no longer binding, but Great Britain continued to hold it as in force. On March 3, 1899, Congress passed a bill providing for the construction of a canal on the Nicaragua route, which also authorized the President to open negotiations with Great Britain for the abrogation of the Bulwer-Clayton Treaty, and, under the last clause a convention between the two countries, abrogating the portions of the treaty that were deemed to be against the interest of the United States, was signed in Washington, Feb. 5, 1900.

BULWER-LYTTON, EDWARD, LORD LYTTON, an English novelist, playwright, and poet, born in London, May 25, 1803; was the son of Gen. Earle Bulwer and Elizabeth B. Lytton, heiress of Knebworth, to whose estates he succeeded in 1844 and assumed the surname of Lytton. In 1847, and again in 1852, he sat in Parliament; and in 1858-1859 was Colonial Secretary, during which he called into existence the colonies of British Columbia and Queensland. In 1866 he was raised to the peerage as Baron Lytton. Altogether his works exceed 60 in number, and fill 110 volumes. His novels display great versatility, range of power, power of handling psychological and social problems, variety of incident and portraiture; and many are based on romantic and occult themes. Among the most famous are "Falkland" (1827); "Pelham" (1828); "Devereux" (1829); "Paul Clifford" (1830); "Eugene Aram" (1832); "Godolphin" (1833); "Pilgrims of the Rhine" (1834); "Last Days of Pompeii" (1834); "Rienzi" (1837); "Ernest Maltravers" (1837); "Alice, or the Mysteries" (1838); "Last of the Barons"

(1843); "Harold" (1843); "The Caxtons" (1850); "My Novel" (1853); "What Will He Do with It?" (1859); "A Strange Story" (1862); "The Coming Race" (1871); "Kenelm Chillingly" (1873); and "The Parisians" (1873). Three of his dramas—"The Lady of Lyons" (1838); "Richelieu" (1838); and "Money" (1848)—still hold the stage. He died in Torquay, Jan. 18, 1873.

BUMBLE BEE. See BEE.

BUMPUS, HERMON CAREY, American scientist and ichthyologist; born at Buckfield, Me., May 5, 1862. He studied at Brown University, from which he graduated in 1884. From 1886 to 1889, he was professor of biology at Olivet College, Michigan, and in 1892 took the chair of comparative anatomy at Brown University. He was made director of the biological laboratory of the Government Fish Commission at Woods Hole, Mass., in 1898, and became director of the American Museum of Natural History, New York, in 1902. From 1914 to 1919 he was president of Tufts College, Massachusetts. He wrote numerous monographs on scientific subjects.

BUNCOMBE, a county in North Carolina. The term bunkum, meaning talking for talking's sake, bombastic speech making, is said to have originated with a Congressional member for this county, who declared that he was only talking for Buncombe, when attempts were made to cut his oratory short.

BUNDESRAT (bönd'es-rät), the Federal Council of the former German Empire which represented the individual states of the Empire, as the Reichstag represented the German nation. It consisted of 61 members, and its functions were mainly those of a confirming body, although it had the privilege of rejecting measures passed by the Reichstag. It went out of existence when Germany became a republic in 1918.

BUNDY, OMAR, an American army officer; born in Newcastle, Ind., in 1861. He graduated from the United States Military Academy in 1883 and from the Army War College in 1913. He served in the campaign against the Sioux Indians in South Dakota, 1890-1891, and saw service in the Spanish-American War and in the Philippines. He rose through the various grades until he was made major-general, Aug. 5, 1917. He was commander of the Second Division, A. E. F., in France, October, 1917, to July, 1918, and of the Sixth and Seventh Army Corps, July to October, 1918.

BUNGALOW, originally the name applied to the kind of houses erected by Europeans in India. They are generally of one story, and with the roof thatched, the ceiling being often of white-washed cloth. They are not well adapted for defense against a foe. In recent times the term has assumed a general meaning, being used of any small house or cottage of one story.

BUNION, a term applied in surgery to enlarged bursæ, or synovial sacs, situated on any part of the foot; but most common over the metatarso phalangeal joint of the first or the fifth toe (see Foot), and accompanied by more or less distortion of the joint. In the great majority of cases, bunions are directly produced by the pressure of badly fitting boots; and if the boots are constructed of patent leather, or any material which stops the excreting action of the skin, this, too, may be regarded as an indirect cause of their formation. Sometimes, however, the tendency to suffer from bunions is hereditary, and almost irremediable. A bunion begins as a painful and tender spot at some point exposed to pressure; the part gradually enlarges, and there are indications of an effusion into a natural bursa or a newly formed sac. The progress of the affection may stop here, the enlarged bursa remaining, and serving to protect the subjacent parts from pressure; but far more frequently the bunion undergoes repeated attacks of inflammation, causing further increase in size; or becomes the seat of corns or of suppuration. The last action may be followed either by obliteration of the cyst and a cure; or, especially in persons of languid circulation, by a troublesome form of ulcer. The one great thing, when there is a tendency to bunions, is the wearing of roomy boots or shoes, of soft and pervious material, and so shaped as not to press upon susceptible points.

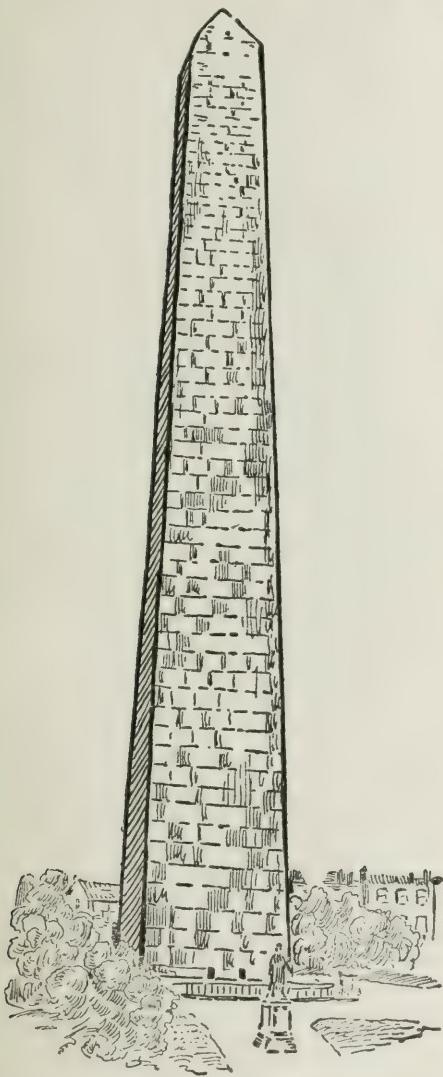
BUNKER HILL, an eminence 110 feet high, in the Charlestown district of Boston, Mass., connected by a ridge with another elevation, 75 feet high, named Breed's Hill. These heights are memorable as being the scene of a battle, June 17, 1775, known under the name of Bunker Hill. The city of Boston was occupied by the British under General Gage, who had resolved to begin offensive operations against the rebels. This design becoming known in the American camp, it was determined to seize and fortify the heights of Charlestown on the night of June 16. The execution of this perilous mission was confided to Colonels Prescott and Pepperell at the head of a brigade of 1,000 men; and at dawn of

day a strong redoubt was already completed on Breed's Hill. About 1,500 Americans advanced successively to the relief of Prescott. At about 2:30 o'clock, two columns of the British advanced to a simultaneous assault; they were received with a terrific fire, and twice

was no pursuit beyond Charlestown Neck. The British loss was 226 officers and men killed, and 828 wounded; that of the Americans 145 killed or missing, and 304 wounded. Although a defeat, the moral result of this action was great. The Americans had seen superior numbers of the disciplined soldiers of England retreat before their fire, and given the proof that they were able to defend their liberties. On Breed's Hill stands now the Bunker Hill Monument, the cornerstone of which was laid by the Marquis de Lafayette, June 17, 1825. This monument was unveiled June 17, 1843. It consists of a plain granite shaft, 220 feet high, 31 feet square at the base, and 15 at the top. Within is a winding staircase, by which it is ascended to a chamber immediately under the apex, 11 feet in diameter, containing four windows, which afford a magnificent panoramic view of the surrounding country.

BUNNER, HENRY CUYLER, an American poet and story writer, born in Oswego, N. Y., Aug. 3, 1855; became a journalist in 1873, and was editor of "Puck" from shortly after its start till his death. Author of "A Woman of Honor" (1883); "Airs from Arcady and Elsewhere" (1884); "The Midge" (1886); "The Story of a New York House" (1887); "Zadoc Pine and Other Stories" (1891); "Short Sixes" (1891); "The Runaway Browns" (1892); "Jersey Street and Jersey Lane" (1896); and "In Partnership" with Brander Matthews (1883). Also a play, "The Tower of Babel" (1883); and uncollected magazine articles. He died in Nutley, N. J., May 11, 1896.

BUNSEN, CHRISTIAN KARL JOSIAS, BARON, a German diplomatist and scholar, born at Korbach, Waldeck, Aug. 25, 1791. In 1815 he made the acquaintance of Niebuhr, who shortly after procured for him the post of secretary to the Prussian Embassy at Rome. In 1824 he was appointed chargé d'affaires, and afterward Minister. After a stay of 12 years in Rome he was sent, as Prussian Minister, first to Switzerland, and then to England, where he remained till the breaking out of the Eastern difficulty in 1854. In his official capacity he won the esteem of all, and with Great Britain especially he was connected by many ties. His later years were spent at Heidelberg and at Bonn, exclusively in literary pursuits. Among his best known works are "The Constitution of the Church of the Future" (1845); "Egypt's Place in the World's History" (1845); "Hippolytus and His Time" (1851); and lastly, his greatest



BUNKER HILL MONUMENT

repulsed in disorder. When the Americans had exhausted all their ammunition, Prescott gave the order for retreat. They received a destructive volley as they left the redoubt. The retreat was harassed by a raking fire from the British ships and batteries, but there

work, "Bible Commentary for the Community," the publication of which was unfinished at his death, Nov. 28, 1860. His "Memoirs," by his widow, were published in 1868.

BUNSEN, ROBERT WILHELM EBERHARD, a German chemist, born in Göttingen, March 31, 1811. He studied at Göttingen University, and at Paris, Berlin, and Vienna; was appointed professor at the Polytechnic Institute of Cassel, 1836; at the University of Marburg in 1838, at Breslau in 1851, and finally Professor of Experimental Chemistry at Heidelberg in 1852. Among his many discoveries and inventions are the production of magnesium in quantities, magnesium light, spectrum analysis, and the electric pile and the burner which bear his name. He died in Heidelberg, Aug. 16, 1899.

BUNSEN'S BURNER, a form of gas burner especially adapted for heating, consisting of a tube, in which, by means of holes in the side, the gas becomes mixed with air before consumption, so that it gives a non-luminous smokeless flame.

BUNT, the *tilletia caries*, which attack the ears of wheat, completely filling the grains with a black, fetid powder. This powder is a mass of spherical, reticulated spores, which, when crushed, give out a most disagreeable smell. It was formerly called *uredo fætida*, or stinking rust. Bread made from flour containing this fungus has a disagreeable flavor and a dark color. Such flour, however, is said to be sometimes used in the manufacture of gingerbread, the molasses effectually disguising the flavor. The presence of bunt is readily detected by the microscope.

BUNTER SANDSTONE, one of the three great divisions of Triassic formation. It is the lowest, *i. e.*, the oldest, of the series. It corresponds to the *grès bigarré* (variegated freestone or grit) of the French. In the Hartz it is more than 1,000 feet thick; in Cheshire and Lancashire, England, about 600. The footprints of old called *chirotherium*, now known to be labyrinthodont, are found in the bunter; the plants are chiefly ferns, cycads, and conifers.

BUNTING, the popular name of a number of insectivorous birds, family *emberizidae*, chiefly included in the genus *emberiza*; such as the English or common bunting; the rice bunting; the Lapland, snow, black-headed, yellow, cirl, and ortolan buntings. The yellow bunting or yellow hammer (*E. citrinella*) is one of the most common British birds.

The common or corn bunting (*E. miliaria*) is also common in cultivated districts. The snow bunting (*plectrophanes nivalis*) is one of the few birds which cheer the solitudes of the Polar regions.

BUNTING, a thin woolen stuff, of which the colors and signals of a ship are usually formed; hence a vessel's flags collectively.

BUNYAN, JOHN, an English author, born in Elstow, Bedford, in November, 1628. He was the son of a tinker, went to the village school, and at 17 enlisted in the Parliamentary army and served



JOHN BUNYAN

during the decisive year of 1645. In 1653 he joined a little community sometimes described as a Baptist Church, and preached in the villages near Bedford until imprisoned in the Bedford jail. Here he remained for 12 years, being only released after the Declaration of Indulgence in 1672. The "Pilgrim's Progress" was begun while the author was in prison, and was issued in 1678, a second part appearing in 1684. His other important works are "Grace Abounding," written in prison, and the "Holy War" (1682). Altogether he wrote nearly 60 books. He died in London, Aug. 31, 1688.

BUONAPARTE. See **BONAPARTE**.

BUONARROTI, MICHAEL ANGELO. See **ANGELO**.

BUOY, any floating body employed to point out the particular situation of a ship's anchor, a shoal, the direction of a navigable channel, etc. They are made

of wood, or, now, more commonly of metal. They are generally moored by chains to the bed of the channel, etc. They are of various shapes, and receive corresponding names; thus, there are the can buoy, the nun buoy, the bell buoy, the mooring buoy, the whistling buoy, etc. The name is also given to a floating object intended to keep a person afloat till he can be taken from the water: more particularly called a life buoy.

BURBAGE, RICHARD, an English actor and contemporary of Shakespeare, was the son of James Burbage, also an actor, and the first builder of a theater in England, born about 1567. He was a member of the same company as Shakespeare, Fletcher, Hemming, Condell, and others, and filled all the greatest parts of the contemporary stage in turn. He was the original Hamlet, Lear, Othello, and Richard III., and played the leading parts in the plays of Beaumont and Fletcher, Ben Jonson, Webster, Marston, etc. Besides being an eminent actor, he seems to have been also a successful painter in oil colors. He died in 1619.

BURBANK, LUTHER, an American naturalist; born at Lancaster, Mass., March 7, 1849. Much of his boyhood was spent on a farm, a circumstance to which is attributable the love of nature that led him, after three years in a wood-turning plant in Worcester, Mass., to direct his attention to horticulture, especially with the view of experimenting with new specimens. He bought a farm at Lunenburg, Mass., and devoted himself to the study of new varieties of fruits, vegetables, and flowers. He removed to Santa Rosa, Cal., in 1875, and established his experimental farm under conditions of soil and climate most favorable for his investigations. Here his successes were so pronounced that he was considered a veritable wizard of horticulture. He was the originator of new species of chestnuts and walnuts; of the low bush-like Delaware plumtree; of the Burbank plum, introduced with great success in New Zealand and south Africa; as well as of the Nickson, Gold, Chalco, and other new species of plum. From crossing with different varieties he has produced many hybrids, among the most remarkable of which is a white blackberry. Not the least wonderful of his results have been obtained with flowers; the Shasta daisy, and the gigantic amaryllis, being among his many remarkable discoveries. His gardens constitute one of the features of that section of California, not only on account

of the results of his skill, but also on account of their extensive operations, 80,000 lilies at one time being seen in full bloom. The Carnegie Institution awarded him \$10,000 for 10 years for his experiments. Among his publications are: "Training of the Human Plant," "New Creations in Plants and Flowers," and "Fundamental Principles of Plant Breeding."

BURBOT, or **BURBOLT**, a fish of the eel family, genus *lota* (*L. vulgaris*), shaped somewhat like an eel, but shorter, with a flat head. It has two small barbs on the nose and another on the chin. It is called also eel pout or coney fish, and is said to arrive at its greatest perfection in the Lake of Geneva. It is a delicate food. The spotted burbot is found in American northern lakes and rivers.

BURBRIDGE, STEPHEN GANO, an American military officer, born in Scott county, Ky., Aug. 19, 1831; organized for the Union army the famous 26th Kentucky Regiment, which he led at Shiloh, where he was promoted to the rank of Brigadier-General of Volunteers. He was engaged in the Vicksburg expedition under General Grant; led the charge at Arkansas Post and at Port Gibson, being the first to enter each of these places, and was retired with the brevet of Major-General in 1865. He died in 1894.

BURCH, CHARLES SUMNER, an American Protestant Episcopal clergyman; born in Pinckney, Mich., in 1855. He studied at the University of Michigan, from which he graduated in 1875. From 1897 to 1905, he was editor of the Grand Rapids "Evening Press." In the latter year he was ordained to the ministry of the Protestant Episcopal Church, and was assigned to a charge in Staten Island. In 1911, he was made a suffragan bishop, and after the death of Bishop Greer in 1920 succeeded the latter as bishop of the New York diocese. He died in December, 1920.

BURCHARD, SAMUEL DICKINSON, an American Presbyterian clergyman, born in Steuben, N. Y., Sept. 6, 1812; for many years pastor in New York City; created much political excitement throughout the United States by an alternative characterization of the Democratic party during the Presidential campaign of 1884. A company of clergymen, about 600 in number, called on James G. Blaine, the Republican candidate, at the Fifth Avenue Hotel, New York City, where Burchard made an address, in which he affirmed that the

antecedents of the Democracy were "Rum, Romanism, and Rebellion." He died in Saratoga, N. Y., Sept. 25, 1891.

BURDETT-COUTTS, ANGELA GEORGINA, BARONESS, daughter of Sir Francis Burdett, born April 21, 1814. In 1837 she inherited much of the property of her grandfather, Thomas Coutts, the banker. Besides spending large sums of money in building and endowing churches and schools, she endowed the three colonial bishoprics of Cape Town, Adelaide, and British Columbia, founded an establishment in South Australia for the improvement of the aborigines, organized the Turkish Compassionate Fund (1877), and established a fishery school at the Irish village of Baltimore (1887). To the city of London she presented, besides several handsome fountains, the Columbia Market, Bethnal Green (1870), for the supply of fish in a poor district; she also built Columbia Square, consisting of model dwellings at low rents, for about 300 families; and the People's Palace owed much to her generosity. In 1871 she accepted a peerage. In 1881 she was married to William Ashmead-Bartlett (born in 1851, who in 1882 obtained the royal license to assume her name, and who, in 1885, was elected Conservative member for Westminster. She died Dec. 30, 1906.

BURDETTE, ROBERT JONES, an American journalist and humorist, born in Greensboro, Pa., July 30, 1844. He served in the Union army during the Civil War. He is famous for humorous newspaper skits, of rare variety, charm, and unrepitious freshness; begun in the Burlington (Ia.) "Hawkeye," of which he became associate editor in 1874. Among his works are "The Rise and Fall of the Mustache," a lecture (1877); "Hawkeyes," collected articles (1880); "Life of William Penn" (1882); "Sons of Asaph," "Chimes from a Jester's Bells," etc. He was licensed as a Baptist clergyman in 1887.

BURDICK, FRANCIS MARION, an American jurist and legal writer, born in De Ruyter, N. Y., Aug. 1, 1845. He was graduated at Hamilton College in 1869 and at its Law School in 1872. He practiced law in Utica, N. Y., from 1872 to 1883, and was later Professor of Law at Hamilton College and at Cornell. From 1891 to 1916 he was Dwight Professor of Law at Columbia. He has written "Law of Sales," "Law of Partnership," and other legal text books.

BURDOCK, the English name of *arctium*, a genus of plants belonging to

the order *asteraceæ* (composites), and the sub-order *tubifloræ*. The common burdock, *A. lappa*, is well known.

BUREAU, a French word signifying a writing table or desk; also an office for transacting business, a department of government, or the officials that carry it on. In the United States, it is also used in the latter sense; but is universally the word for a chest of drawers.

BUREAUCRACY, government by departments of state, acting with some measure of independence of each other, instead of government by the heads of those departments acting as a cabinet on their joint responsibility.

BÜRGER, GOTTFRIED AUGUST, (bürg'er), a German poet, born in Molmerswende, Anhalt, Dec. 31, 1747. Shakespeare and Percy's "Reliques of English Ballad Poetry" had a decisive influence in giving direction to his efforts at poetic expression. "Lenore" (1773), established his reputation as a poet, which was sustained by the ballads that followed it, "The Parson's Daughter," "The Wild Huntsman," "The Song of the Brave Man," "Kaiser and Abbot." Specimens of his burlesque ballads are "The Robber Count," "The Wives of Weinsberg." He died in Göttingen, June 8, 1794.

BURGESS, CHARLES FREDERICK, an American chemist and engineer; born in Oshkosh, Wis., June 5, 1873. After graduating from the University of Wisconsin, he entered its faculty as instructor and assistant professor of electrical engineering in 1895. Of an inventive turn of mind, he developed several new processes in electrolysis, and in 1904 was made investigator of electrolytic iron alloys for the Carnegie Institute and President of the Northern Chemical Engineering Laboratories. In 1910 he wrote "The Strength of the Alloys of Nickel and Copper with Electrolytic Iron."

BURGESS, EDWARD, an American naval architect born in West Sandwich, Mass., June 30, 1848. He was educated at Harvard, where he graduated in 1871, and became secretary of the Boston Society of Natural History. He was instructor of entomology at Harvard from 1879 to 1883. He then became a designer of sailing yachts. In 1884 he designed the "Puritan," the winner of the America's Cup in 1885; and a year later the "Mayflower," the winner in 1886. He died in Boston, Mass., July 12, 1891.

BURGESS, (FRANK) GELETT, an American author and artist; born in

Boston, Jan. 30, 1866. He was educated at the Massachusetts Institute of Technology, from which he graduated in 1887. He embraced civil engineering as a profession, and had considerable railway experience (1887-1890) in California. In 1896 he took up literary work and speedily attracted favorable attention. Most of his writings were illustrated by himself. His work is of a whimsical and humorous nature. Among his publications are "Vivette" (1897); "Goops and How to Be Them" (1900); "The Pickaroons" (1904); "Are You a Bromide?" (1906); "Love in a Hurry" (1913); "Mrs. Hope's Husband" (1917); etc.

BURGESS, FREDERICK, an American Protestant Episcopal bishop born in Providence, R. I., in 1853. He graduated from Brown University in 1873, and from 1874 to 1875 studied at the General Theological Seminary, afterward spending a year in post-graduate studies in Oxford. He was ordained priest in 1877 and served as rector of several churches in New England, Pennsylvania, and Detroit. He was rector of Grace Church, Brooklyn, from 1898 to 1902, and in the latter year he was consecrated bishop of Long Island.

BURGESS, JOHN WILLIAM, an American educator, born in Cornersville, Tenn., Aug. 26, 1844. He was educated at Cumberland University, Lebanon, Tenn., and at Amherst. He studied law, and began its practice at Springfield in 1869. During this year he was appointed Professor of English Literature and Political Economy at Knox College. Two years later, he studied abroad at Göttingen, Leipsic, and Berlin. On his return, he became Professor of History and Political Science at Amherst, and in 1876 Professor of Political Science and of Constitutional Law and in 1890 dean of the faculty of Political Science at Columbia University, New York. He was Roosevelt exchange professor at the University of Berlin 1906-1907. He published a number of books and was a frequent contributor to reviews on historical, political, and legal topics.

BURGH, the same as borough. The spelling borough is the common one in England, while burgh is that which chiefly prevails in Scotland. Examples: Scar-borough, Edin-burgh. A burgh of barony, in Scotland, is a certain tract of land created in a barony by the feudal superior, and placed under the authority of magistrates. A royal burgh in Scotland is a corporate body created by a charter from the crown. There is a convention of royal burghs. In the United States the termination borough was for

generations added to the names of places, as in England; but, under a decision of the United States Board on Geographic Names, the form is now boro, as Brattle-boro.

BURGHER, a former subdivision of the Scottish Secession Church. The Secession, which originated through the withdrawal of Ebenezer Erskine and some other ministers from the Scottish establishment in 1732, split in two in 1747, part having felt free to take, while others refused what they deemed an en-snaring burgess oath. They reunited in 1820 under the name of the Associate Synod, and, joining with the "Relief" in 1847, formed the United Presbyterian Church.

BURGKMAIR (börk'mer), a family of German artists in the 15th and 16th centuries, the best known of whom is HANS, born in Augsburg in 1472. Several of his paintings are to be seen at Augsburg, Munich, Nuremberg, etc., but these have contributed far less to his fame than his woodcuts, which are not inferior to those of his friend, Albert Dürer. The most celebrated is the series of 135 cuts representing the "Triumph of the Emperor Maximilian." He died in 1531.

BURGLARY, the crime of breaking into an inhabited house, a church, or the gates of a town by night with the intention of committing a felony. In the United States, burglary is punished by State laws, but the common law is generally followed. Some States include breaking into shops, offices, warehouses, factories, and meeting houses as burglary. An Act of Congress of 1825 expressly includes breaking into boats and vessels with intent to commit a felony. In some States the same deed done in the daytime is defined as burglary in the second degree. The night is the time, between one hour after sunset and one hour before sunrise, or when the features of a man cannot be clearly discerned. In the United States, burglary is never punished by penal servitude for life, but long sentences are frequently imposed.

BÜRGLEN (bürg'len), a village of Switzerland, in the canton of Uri, about a mile from Altorf; is the traditional birthplace of William Tell. The supposed site of the patriot's house is now occupied by a chapel, erected in 1522, upon the walls of which are represented certain well-known scenes from his history.

BURGOMASTER, or **BÜRGER-MEISTER**. The title of the chief magis-

trate of German towns or cities, corresponding to the English *mayor*, the Scotch *provost*, and the French *maire*.

BURGOS, a city of northern Spain, once the capital of the kingdom of Old Castile, and now the chief town of the province of Burgos. It stands on the declivity of a hill on the right bank of the Arlanzon, and has dark, narrow streets full of ancient architecture, but there are also fine promenades in the modern style. The cathedral, commenced in 1221, is one of the finest examples of Gothic architecture in Spain. It contains the tombs of the famous Cid, and of Don Fernando, both natives of Burgos, and celebrated throughout Spain for their heroic achievements in the wars with the Moors. Before the removal of the court to Madrid, in the 16th century, Burgos was in a very flourishing condition, and contained thrice its present population. It has some manufactures in woolens and linens. Pop. about 33,000. Province has an area of 5,480 square miles, largely hilly or mountainous, but with good agricultural and pastoral land. Pop. about 350,000.

BURGOYNE, JOHN, an English general and dramatic author, born Feb. 24, 1723. After having served with distinction in Portugal, he was sent to America in 1775. He joined General Gage at



GENERAL JOHN BURGOYNE

Boston, with large re-enforcements, and witnessed the battle of Bunker Hill, of which he has left an animated description. After proceeding to Canada as Governor, he returned to England, but, in 1777, was dispatched to take com-

mand of that expedition from Canada against the United States, the failure of which so largely contributed to the establishment of American freedom. Few battles, indeed, have achieved, in their ultimate influence, results so great as the surrender of Burgoyne with 5,791 fighting men, well provided with artillery, at Saratoga, to the army of General Gates. On his return home, he was received by the King with marked disfavor. Burgoyne did not possess the genius of a great general, and was in many respects utterly inadequate to the tasks imposed upon him, yet no one can read the work published in his defense—“State of the Expedition from Canada” (London, 1780)—without acknowledging his courage, and detecting qualities, which, in a less exalted station, might have been of service to his country. Disgusted with his treatment by the government, he retired into private life, and devoted his leisure to the production of dramas, many of which, as the “Maid of the Oaks,” “The Lord of the Manor,” etc., were highly popular in their day. His best play, “The Heiress,” still keeps the stage. He died in London, Aug. 4, 1792.

BURGOYNE, SIR JOHN FOX, an English engineer, son of the preceding, born in London, July 24, 1782. Entering the Royal Engineers he served in Malta, Sicily, Egypt, and, with Sir John Moore and Wellington, in the Peninsula from 1809 to 1814, and was present at all the sieges, generally as first or second in command of the engineers. In 1851 he was made a lieutenant-general, and was chief of the engineering department at Sebastopol till recalled in 1855. In the following year he was created a baronet, and in 1868 a field marshal. He died Oct. 7, 1871.

BURGUNDY, a region of western Europe, so named from the Burgundians, a Teutonic or Germanic people originally from the country between the Oder and the Vistula. They migrated first to the region of the upper Rhine, and, in the beginning of the 5th century, passed into Gaul and obtained possession of the S. E. part of the country, where they founded a kingdom having its seat of government sometimes at Lyons and sometimes at Geneva. They were at last wholly subdued by the Franks. In 879 Boson, Count of Autun, succeeded in establishing the royal dignity again in part of this kingdom. He styled himself King of Provence, and had his residence at Arles. His son, Louis, added the country beyond the Jura, and thus established Cisjurian Burgundy. A second kingdom arose when Rudolph of

Strettlingen formed Upper or Transjurian Burgundy out of part of Switzerland and Savoy. Both these Burgundian kingdoms were united, and finally, on the extinction of Rudolph's line, were incorporated with Germany. But a third State, the historical DUCHY OF BURGUNDY, consisting principally of the French province of Bourgogne or Burgundy, had been formed as a great feudal and almost independent province of France in the 9th century. This first ducal line died out with a Duke Philip, and the duchy, reverting to the crown, was, in 1363, granted by King John of France to his son, Philip the Bold, who thus became the founder of a new line of Dukes of Burgundy. A marriage with Margaret, daughter of Louis III., Count of Flanders, brought him Flanders, Mechlin, Antwerp and Franche-Comté. He was succeeded by his son, Duke John the Fearless, whose son and successor, Philip the Good, so greatly extended his dominions that, on his death, in 1467, his son Charles, surnamed the Bold, though possessing only the title of Duke, was in reality one of the richest and most powerful sovereigns of Europe. Charles left a daughter, Mary of Burgundy, the sole heiress of his States, who by her marriage to Maximilian of Austria transferred a large part of her dominions to that Prince, while Louis XI., of France, acquired Burgundy proper as a male fief of France. Burgundy then formed a province, and is now represented by the four departments of Yonne, Côte-d'Or, Saône-et-Loire, and Ain. It is watered by a number of navigable rivers, and is one of the most productive provinces in France, especially of wines.

BURGUNDY PITCH, the *pix burgundica*, the resinous exudation of the stem of the spruce fir, *abies excelsa* or *pinus abies*, melted and strained. It is got from Switzerland, but seldom genuine. It is hard and brittle, opaque, of a dull reddish brown color, empyreumatic odor, and aromatic taste. It gives off no water when heated, is not bitter, and is free from vesicles. It consists chiefly of resin and a little volatile oil, whence its odor. The resin resembles that of turpentine. Pitch plaster acts externally as a slight stimulant to the skin. It enters also into the composition of the iron plaster.

BURGUNDY WINE, the finest of all the French wines, the product of vines cultivated in the Côte-d'Or, a portion of the ancient province of Burgundy. The most noted of the red wines of Burgundy are Richebourg and Chambertin. The white wines are less celebrated.

BURHANPUR, a town of India, Central Provinces, formerly the capital of Kandeish, and famous for its muslin and flowered silk manufactures, which still exist to some extent, though the town has long been declining. Pop. about 20,000. Under the Moguls the city had an area of 5 square miles.

BURIAL, the most universal method of disposing of the dead, the practice of burning them on a funeral pile, prevalent to a limited extent among the Greeks and the Romans, and nearly universal among the Hindus, being the exception and not the rule. The Egyptians and, at least in some special cases, the Jews embalmed their dead. In Europe, according to Sir John Lubbock, interments in which the corpse is in a sitting or contracted posture belong to the stone age, those in which it has been burned and only the ashes interred, to the bronze age, and those in which the corpse lies extended, presumably to the age of iron. During the first French Revolution a proposal was made to adopt the process of cremation, but it failed. The project was revived on the Continent during the 19th century, and recommended in England, in 1873, by Dr. Henry Thompson, but as yet it has met with only limited acceptance from the public. See CREMATION.

BURIAN, VON RAJECZ, BARON STEFAN, an Austro-Hungarian statesman; born near Pressburg, Hungary, Jan. 15, 1851. He received his education at Pressburg and Vienna and entered upon a diplomatic career. He served in minor capacities as consul chiefly at Balkan capitals where he obtained a profound knowledge of Balkan personalities and politics. He was made Consul-General at Moscow and later was promoted to the post of Ambassador to Greece. In 1903 he was made chief administrator of Bosnia-Herzegovina, and after the outbreak of the World War succeeded Count Berchtold as Premier Foreign Minister of the Dual Monarchy. His appointment had as its moving cause the hope that he would be able by suitable concessions to keep Italy from entering the war on the side of the Allies—a matter in which Berchtold had not been making satisfactory progress. Burian likewise failed, although he was ready to make great concessions. During his term of office he was engaged in various diplomatic controversies with the United States in regard to the sinking of American vessels by Austrian submarines. He resigned in December, 1916, and assumed the portfolio of finance under his successor. In April, 1918, he was again appointed Premier

and Foreign Minister. He was in office when the Austrian peace offensive was fruitlessly made in the last months of the war. He was a man of great ability and conciliatory temperament.

BURIATS, a nomadic Tartar people allied to the Kalmucks, inhabiting the S. part of the government of Irkutsk and Transbaikalia. Their number is about 300,000. They live in huts called *yurts*, which in summer are covered with leather, in winter with felt. They support themselves by their flocks, by hunting, and the mechanical arts, particularly the forging of iron. The religion of the majority is Lamaism, though some have become converted to the Orthodox Greek Church.

BURIN, or **GRAVER**, the principal instrument used in copper engraving, is made of tempered steel, and is of prismatic form, the graving end being ground off obliquely to a sharp point. The distinctive style of a master is frequently described by such expressions as a soft burin, a graphic burin or a brilliant burin.

BURITI (*bur-re'tē*), a South American palm (*mauritia vinifera*) growing to the height of 100 to 150 feet, preferring marshy situations, and bearing an imposing crown of fan-shaped leaves. A sweet vinous liquor is prepared from the juice of the stem, as also from the fruits.

BURKE, BILLIE (MRS. FLORENZ ZIEGFELD), an American actress, born in Washington, D. C., in 1886. She was educated in France and England and made her first appearance on the stage as a singer in 1902. This was followed by appearances in several musical comedies. Her first dramatic engagement was in 1907, and in the same year she played with John Drew as his leading woman. She became one of the most popular actresses on the stage, and had even greater success in motion-picture plays.

BURKE, EDMUND, a British statesman and orator, born in Dublin, Jan. 12, 1729. He graduated from Trinity College, Dublin, 1748, studied law, and, in 1750, began literary work. Elected to Parliament, he made his first speech in 1766; and from that date until 1790 was one of the chief guides and inspirers of the Whig party. His speeches and pamphlets are still considered among the most striking and suggestive manuals of political philosophy in modern times. They, with his miscellaneous writings, are all included in his "Works and Correspondence" (8 vols., 1852). Among

his most important works, aside from his speeches, are "A Philosophical Inquiry into the Origin of Our Ideas of the Sublime and Beautiful" (1756); "Reflections on the French Revolution" (1790); and "Letters on a Regicide Peace." He died in Beaconsfield, England, July 9, 1797.

BURKE, JOHN, an American public official, born in Keokuk co., Ia., in 1859. He was educated in the public schools and studied law at the State University of Iowa. After practicing law until 1889, he was elected judge of Rolette co., N. Dak. He served in the House and Senate of that State, and as governor for three terms following 1907. In 1913 he was appointed Treasurer of the United States.

BURKE, SIR JOHN BERNARD, an English herald and genealogist; son of John Burke (1787-1848), representative of a Tipperary family, who, in 1826, published the "Peerage and Baronetage of the United Kingdom." The son, born in London, in 1815, and educated at Caen, in Normandy, was trained as a lawyer, and called to the bar in 1839. Besides editing the successive issues of the "Peerage" founded by his father, published other works on related subjects. He died in Dublin, Dec. 13, 1892.

BURKE, MAURICE FRANCIS, an American Roman Catholic bishop, born in Ireland, in 1845. He was educated in several Catholic universities in the United States and at the American College in Rome. He was ordained priest in 1875. From 1878 to 1887 he was rector of St. Mary's Church, Joliet, Ill., and in the latter year was consecrated bishop of Cheyenne, Wyo. In 1893 he was transferred to the see of St. Joseph, Mo.

BURLEIGH, WILLIAM CECIL, LORD, an English Secretary of State under Edward VI. and Elizabeth, and Prime Minister of England for 40 years, born in Lincolnshire, Sept. 13, 1520. In 1588 Parliament was assembled, and, by his advice, a plan of religious reform was laid before it. In this he had a considerable share; and he also took the leading part in the establishment of the Thirty-nine Articles of faith, which form the basis of the reformed religion of the state. To him is also due the regulation of the coinage, which had been altered since Henry VIII.'s time. He was created Baron Burleigh in 1571, and, in 1588, concluded an advantageous treaty with the Netherlands. He died in London, Aug. 4, 1598. His son, ROBERT CECIL, minister under Elizabeth and James I., was sent to the court of Henry IV.,

of France, to negotiate a treaty of peace with Spain. He was greatly instrumental in the death of the Earl of Essex, was loaded with honors by James I., and created Earl of Salisbury.

BURLESON, ALBERT SIDNEY, born at San Marcos, Tex., in 1863. He graduated from the University of Texas in 1884 and in the following year was admitted to the bar. After serving as attorney of the 26th Judicial District of Texas from 1891 to 1898, he was elected to the 56th Congress in 1899. He was again elected in 1903 and was re-elected to the 63d Congress. He resigned to become Postmaster-General in the Cabinet of President Wilson in 1913.

BURLESON, HUGH LATIMER, an American Protestant Episcopal bishop, born in Northfield, Minn., in 1865. He graduated from Racine College in 1887 and afterward studied at the General Theological Seminary. He served as rector in several churches until 1900, when he was appointed dean of the Cathedral of the District of North Dakota. He served as secretary of the Board of Missions for the Protestant Episcopal Church from 1909 to 1916. In the latter year he was consecrated bishop of South Dakota. He wrote "The Conquest of the Continent" (1911); and "Our Church and Our Country" (1918).

BURLESQUE, a low form of the comic, arising generally from a ludicrous mixture of things high and low. High thoughts, for instance, are clothed in low expressions, noble subjects described in a familiar manner, or *vice versa*. The true comic shows us an instructive, if laughable, side of things; the burlesque travesties and caricatures them in order to excite laughter or ridicule.

BURLINGAME, ANSON, an American diplomatist, born in New Berlin, N. Y., Nov. 14, 1822. He was elected a member of the Senate of Massachusetts, and afterward of Congress. He was sent as United States Minister to the Chinese Government in 1861. On his retirement from this post, in 1867, he was requested by the Regent, Prince Kung, to go on a special mission for the Chinese Government to some foreign courts. He died in St. Petersburg, Feb. 23, 1870.

BURLINGAME, EDWARD LIVERMORE, an American editor, born in Boston, May 30, 1848. He studied at Harvard and acted as private secretary to his father, Anson Burlingame, United States Minister to China. Since 1879, he has been associated with the publishing house of Charles Scribner's Sons,

and, from 1886 to 1914, was editor of "Scribner's Magazine."

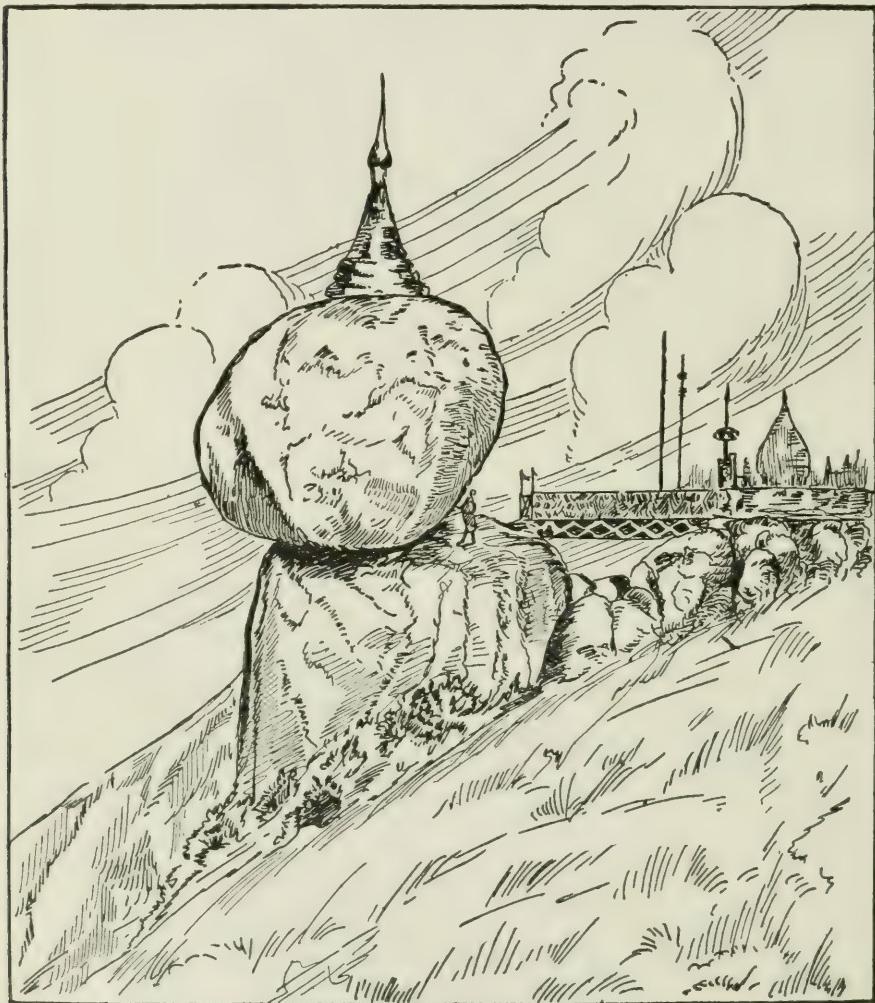
BURLINGTON, a city of Iowa, the county-seat of Des Moines co. It is on the Mississippi river, and on the Chicago, Burlington, and Quincy, the Chicago, Rock Island, and Pacific, and the Toledo, Peoria, and Western railroads. It is an important industrial city and has manufactures of crackers, pearl buttons, agricultural implements, boilers, engines, etc. The machine and repair shops of the Chicago, Burlington, and Quincy railroad are here. The city has an opera house, a court house, hospitals, a public library, and a handsome park. Pop. (1910) 24,324; (1920) 24,057.

BURLINGTON, a city and port of entry in Burlington co., N. J., on the Delaware river and the Pennsylvania railroad; 18 miles N. E. of Philadelphia. It contains St. Mary's Church, endowed by Queen Anne; St. Mary's Hall, the oldest (Protestant) church school for girls in the country; the State Masonic Home; Van Rensselaer Seminary; Burlington Academy, and many fine old residences; and has manufactories of shoes, stoves, iron pipe, terra cotta, and canned goods. The city was settled in 1677, by Friends, under the name of New Bevery; was for many years the seat of government of West Jersey; and was the residence of the last Colonial Governor, William Franklin. It was bombarded by the British, in 1776, and was incorporated in 1784. Pop. (1910) 8,336; (1920) 9,049.

BURLINGTON, city, port of entry and county-seat of Chittenden co., Vt.; on Lake Champlain, the head of the New York Barge Canal, and the Central Vermont and Rutland railroads; 40 miles N. W. of Montpelier. It has a very large lake commerce and manufactories of lumber, cotton and woolen goods, and iron. The environment is agricultural. The city is the seat of the State University of Vermont and of the State Agricultural and Medical Colleges; Bishop Hopkins Hall; the Cathedral of the Immaculate Conception (Roman Catholic); the Fletcher, University, Billings and Burlington Law Libraries; a County Court House; United States Government Building, and a Young Men's Christian Association Hall. Burlington is noted for its benevolent and educational institutions, which include the Mary Fletcher Hospital, Home for Aged Women, Home for Friendless Women, Home for Destitute Children, Adams Mission House, Louisa Howard Mission, Providence Orphan Asylum, Cancer Relief Association, Lake View Retreat, several sanitaria,

the Vermont Episcopal Institute, St. Joseph's and St. Mary's Academies (Roman Catholic), and high and graded schools. The city was settled in 1773; was a garrisoned post during the War of 1812; and was incorporated in 1865. Its material development has been largely due to its great lumbering industries. The famous Col. Ethan Allen is buried beneath a handsome monument in Greenmount Cemetery. Pop. (1910) 20,468; (1920) 22,779.

traversed by great mountain ranges branching off from those of northern India and running parallel to each other southward to the sea. Between these ranges and in the plains or valleys here situated the four great rivers of Burma—the Irrawaddy, its tributary the Chindwin, the Sittang, and the Salwen—flow in a southerly direction to the sea, watering the rich alluvial tracts of Lower Burma, and having at their mouths all the great seaports of the



KYAILTEYO PAGODA, BURMA

BURMA, a country of southern Asia, bounded on the N. by Assam and Tibet, on the E. by Chinese territory and Siam, elsewhere mainly by the Bay of Bengal; area, about 230,000 square miles. It is

country—Rangoon, Bassein, Moulmein, Akyab, etc. The Irrawaddy is of great value as a highway of communication and traffic, being navigable beyond Bhamo, near the Chinese frontier, or

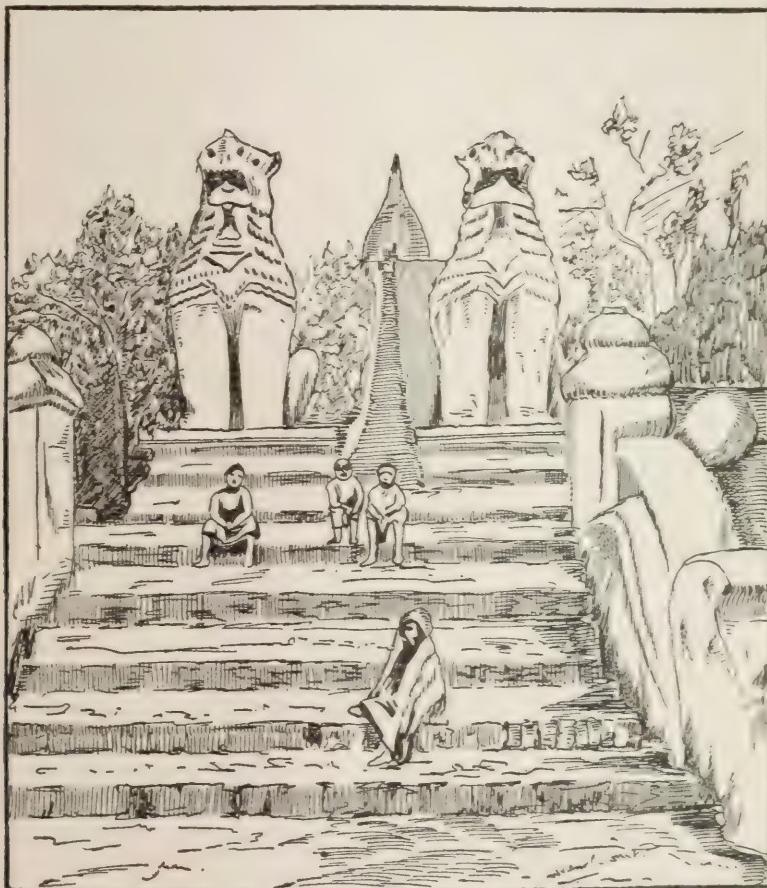


**BURMA, SIAM,
FRENCH INDO-CHINA,
AND
STRAITS SETTLEMENTS**



over 800 miles. In their lower courses the rivers often overflow their banks in the rainy season. Though its resources are almost entirely undeveloped, the country, as a whole, is productive, especially in the lower portions. Here grow rice, sugar cane, tobacco, cotton, indigo, etc. Cotton is grown almost

amber, and jade are also obtained. Among wild animals are the elephant, rhinoceros, tiger, leopard, deer of various kinds, and the wild hog. Among domestic animals are the ox, buffalo, horse, and elephant. The rivers abound with fish. The most common fruits are the guava, custard apple; tamarind,



TEMPLE OF THREE HUNDRED LIONS AT SAGAING, BURMA

everywhere; tea is cultivated in many of the more elevated parts. The forests produce timber of many sorts, including teak, which grows most luxuriantly, and is largely exported. Ironwood is another valuable timber; and among forest products are also the bamboo, cutch, sticklac, and rubber. Burma has great mineral wealth—gold, silver, precious stones, iron, marble, lead, tin, coal, petroleum, etc.; but these resources have not yet been much developed. The chief precious stone is the ruby, and the mines of this gem belong to the crown. Sapphire,

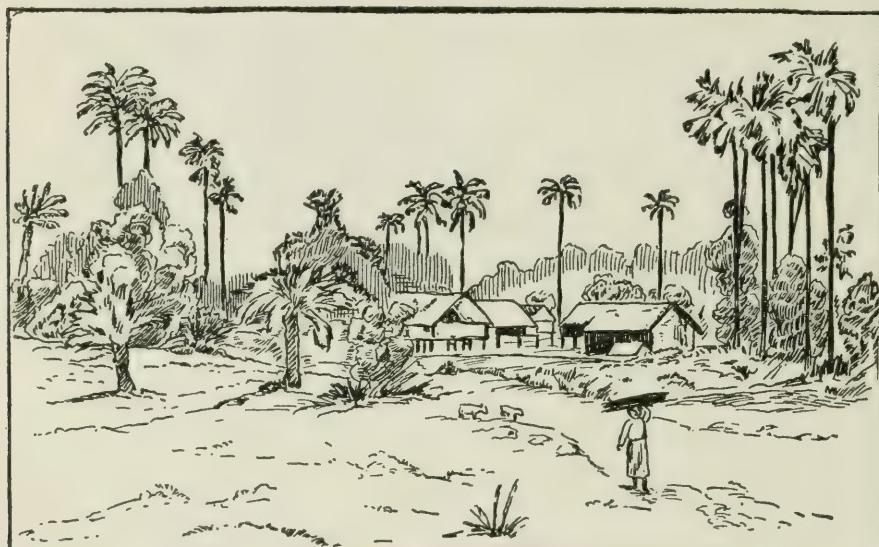
pine, orange, banana, jack, and mango. The yam and sweet potato are cultivated, and in some parts the common potato. The climate, of course, varies according to elevation and other circumstances, but, as a whole, is warm, though not unhealthful, except in low, jungly districts. The rainfall among the mountains reaches as high as 190 inches per annum.

The population may be stated at about 12,000,000, made up of a great variety of races besides the Burmese proper, as Talaings, Shans, Karens, etc. The Bur-

mese proper are of a brown color, with lank, black hair (seldom any on the face), and have active, vigorous, well-proportioned frames. They are a cheerful, lively people, fond of amusement, averse to continuous exertion, free from prejudice of caste or creed, temperate and hardy. The predominant religion is Buddhism. Missionaries are active in their efforts, but the Christian faith has not yet made much progress in the country. Polygamy is permitted by Buddhist law, but is rare, and is considered as not altogether respectable. Divorce is easily

from India) are more or less circular. There is a considerable literature.

Burma is now divided into Lower Burma and Upper Burma, the former till 1886 being called British Burma, while the latter till that date was an independent kingdom or empire. Lower Burma was acquired from Independent Burma in 1826 and 1852 as the result of two wars terminating in favor of Great Britain. It comprises the divisions of Aracan, Pegu, Irrawaddy, and Tenasserim; area, 87,473 square miles; pop. about 3,000,000. Under British rule



A VILLAGE IN BURMA

obtained. Women in Burma occupy a much freer and happier position than they do in Indian social life. They go about freely, manage the household and make successful women of business, conducting not merely retail trades but also large wholesale concerns. Education is very general, one of the chief occupations of the monks in the numerous monasteries being the teaching of boys to read and write. Many of these monastic schools are under government inspection. The Burmese are skillful weavers, smiths, sculptors, workers in gold and silver, joiners, etc. The ordinary buildings are of a very slight construction, chiefly of timber or bamboo raised on posts; but the religious edifices are in many cases imposing, though the material is but brick. Carving and gilding are features of their architecture. The Burmese language is monosyllabic, like Chinese, and is written with an alphabet the characters of which (derived

it has prospered greatly, the population and trade having increased immensely, there being regularly a large surplus revenue. Roads, canals, and railways have been constructed and other public works carried out, as also public buildings erected. The total foreign trade is valued at over \$120,000,000. The chief city and port is Rangoon, which is now connected by railway with Mandalay in Upper Burma.

The government is administered by a lieutenant-governor, and a legislative council of 19 members.

The Burmese Empire is of little note in ancient or general history. Since the 16th century the Burmese proper have mostly been the predominant race, and ruled the Peguans, Karen, etc., throughout the country. The capital has at different times been at Ava, Pegu, Prome, or elsewhere. In the latter half of the 18th century the Burmese Emperors began a series of wars of conquest with

China, Siam, and Assam, through which they greatly enlarged the Empire. This brought them into contact with the British, and, in 1824, war was declared against them on account of their encroachments on British territory and their seizure of British subjects. The war terminated in the cession of the provinces of Aracan and Tenasserim to the British. Peace continued for some years, but latterly various acts of hostility were committed by the Burmese, and, in 1852, the maltreatment of British subjects occasioned a second war, at the end of which the British possessions were extended to include the whole of Pegu. The third and last war occurred in 1885 in consequence of the arrogance and arbitrary conduct of King Theebaw. The result was that Upper Burma was annexed to the British Empire by proclamation of the Viceroy of India, Jan. 1, 1886. The area thus annexed was about 200,000 square miles, of which half belonged to the Kingdom proper, and half to the semi-independent Shan states.

BURNABY, FREDERICK GUSTAVUS, an English descriptive writer, born in Bedford, March 3, 1842. He served in the Royal Horse Guards, in which he became lieutenant-colonel in 1881. In 1875 he made his famous ride to Khiva—a journey that presented great difficulties. In 1876 he rode through Asiatic Turkey and Persia. Of both these journeys he published narratives. He was slain in the battle of Abu-Klea, Jan. 17, 1885.

BURNAND, SIR FRANCIS COWLEY, an English author and dramatist, born Nov. 29, 1836; was educated at Eton and Trinity College, Cambridge. He produced a large number of pieces, chiefly extravaganzas and burlesques; several dramas; and some very successful comedies. He joined Henry J. Byron in starting "Fun," but left that paper for "Punch," then edited by Mark Lemon, in 1863. His contributions to "Punch" included "How, When, and Where" and "Happy Thoughts," which in book form had an extended sale. He was editor of "Punch" from 1880 to 1906. He wrote the libretto for Sullivan's "Chieftain" (1894).

BURNE-JONES, SIR EDWARD COLEY, an English painter, born in Birmingham, Aug. 28, 1833; was educated at Exeter College, Oxford, where he formed a lifelong friendship with William Morris. In 1857 he studied in London under Rossetti, who exerted a powerful influence over his early work. From the first Burne-Jones' subjects were poetical and romantic, and his

treatment of them imaginative and idealistic, while his coloring was singularly pure and beautiful. Most of his earlier works were done in water-color, among them "Merlin and Vivien," "The Wine of Circe," and "Love Among the Ruins." Not until 1870 did he become known as a painter in oils, in which field his style and subjects were inspired chiefly by the early Italian Renaissance. Among his later pictures are "The Days of Creation," "Venus' Mirror," "Chant d'Amour," "The Golden Stairs," "The Tree of Forgiveness," "King Cophetua," "The Legend of the Briar Rose," "The Brazen Tower," "The Bottom of the Sea," etc. His skill in stained glass is shown by the windows of Christ Church, Oxford. He was one of the founders of the New Gallery, and was made a baronet in 1894. He died in London, July 17, 1898.

BURNET, the English name for poterium, a genus of plants belonging to the order *roseaceæ* (roseworts). It is also called salad burnet and lesser burnet. The common or garden salad burnet (*poterium sanguisorba*) is a herbaceous plant one or two feet high, with pinnate leaves and dull purplish flowers. The leaves taste and smell like cucumber, and are eaten in salad. The muriated burnet, or salad burnet (*A. muriatum*), has larger fruit than the former, to which it is closely allied. It is not common. There are other species. The great burnet is *sanguisorba officinalis*.

BURNETT, FRANCES HODGSON, an Anglo-American novelist, born in Manchester, England, Nov. 24, 1849. Her family removed to Tennessee in 1865. She early wrote stories. In 1873 Miss Hodgson married Dr. Burnett, and, in 1875, settled in Washington, where she has since resided. After various short stories, she published as a serial in "Scribner's Magazine" "That Lass o' Lowrie's," which became very popular, was promptly issued in book form (1877), and was dramatized. It was followed by a number of novels, among which are "Haworth's" (1879); "Louisiana" (1881); "Esmeralda," "A Fair Barbarian" (1882); "Through One Administration" (1883); "Little Lord Fauntleroy," a juvenile story, also dramatized (1887); "The Pretty Sister of José" (1889); "The One I Knew Best of All," an autobiography (1893); "A Lady of Quality" (1895); "His Grace of Osmonde" (1897); "I. Tembarom" (1913); "The Lost Prince" (1915); "White People" (1917); etc. In 1898 she obtained a divorce from Dr. Burnett, and in 1900 married Stephen Townsend.

BURNEY, SIR CECIL, British naval commander; born May 15, 1858. He was educated at the Royal Naval Academy, Gosport. He served during the Egyptian War, and was active in the eastern Soudan campaign of 1884. From 1909 to 1910, he was Admiral of the Plymouth sub-division of the Home Fleet. In 1911-1912, he commanded successively the Atlantic Fleet and the Third Squadron as Vice-Admiral. He was second in command of the Grand Fleet 1914-1916, and took a distinguished part in the battle of Jutland, May 31, 1916. He was created a K. C. B. in 1913.

BURNEY, CHARLES, an English author, born in Shrewsbury, April 7, 1726. He became a famous and influential musician in London; was given the degree of Doctor of Music by Oxford in 1769; and sacrificed time, money, and personal comfort to travel and collect material for his "History of Music" (4 vols., 1776-1789). He also wrote "Memoirs and Letters of Metastasio" (3 vols., 1796). Madame D'Arblay was his daughter. He died in Chelsea, April 12, 1814.

BURNEY, FRANCES (MADAME D'ARBLAY), an English novelist, daughter of Charles Burney, born in King's Lynn, Norfolk, June 13, 1752. After she had published "Evelina, or a Young Lady's Entrance Into the World" (1778), she became the favorite of the literary men of the day, especially Dr. Johnson. Her second novel, "Cecilia" (1782), was no less admired. In 1786 she was made Second Keeper of Robes to Queen Charlotte, and in 1793 she was married to M. D'Arblay, a French army officer. Her other books are "Camilla" (1795), and "The Wanderer, or Female Difficulties" (1814). Her "Diary and Letters," edited by her niece (7 vols., 1842-1846), are affected, but entertaining. She also wrote memoirs of her father (1832). She died in Bath, Jan. 6, 1840.

BURNHAM, CLARA LOUISE, an American story writer, born in Newton, Mass., May 25, 1854. She wrote numerous novels, including "Dearly Bought" (1884); "Next Door" (1886); "Young Maids and Old" (1888); "Miss Bagg's Secretary" (1892); "Sweet Clover, a Romance of the White City" (1894); "The Right Princess" (1902); "The Inner Flame" (1912); "In Apple Blossom Time" (1919); etc.

BURNHAM, DANIEL HUDSON, an American architect, born in Henderson, N. Y., Sept. 4, 1846. He studied architecture in Chicago and designed notable

structures there, including the Rookery, Calumet Club, the Temple, Masonic Temple, and the Great Northern Hotel, as well as large buildings in other cities. He was Director of Works at the Chicago World's Fair. He died June 1, 1912.

BURNHAM, WILLIAM POWER, an American soldier, born at Scranton, Pa., in 1860. He studied at West Point from 1877 to 1880. In 1881 he enlisted as a private in the 14th Infantry, and in 1883 he was promoted from the ranks. During the Spanish-American War he served as lieutenant-colonel of the 4th Missouri Volunteers. He served also in the Philippine insurrection in 1900 and 1902. He was appointed a major in the United States Army in 1906. In the following year he was appointed a member of the general staff, serving until 1911. He held commissions in Porto Rico and in the Canal Zone, and was appointed brigadier-general in 1917, when he was assigned to the 164th Infantry Brigade of the 82d Division of the National Army. He was appointed to be major-general in April 12, 1918. From December, 1917, to October 5, 1918, he commanded the 82d Division. He was American delegate to the Inter-Allied Military Commission in Greece in 1918-1919. In the latter year he was honorably discharged as major-general, becoming colonel of infantry. He received several decorations and medals from foreign countries for his service during the World War. He wrote "Three Roads to a Commission in the United States Army" and several monographs on military subjects.

BURNING BUSH, in botany: (1) The artillery plant, *pilea serpyllifolia*, an urticaceous species; (2) *euonymus atropurpureus*, and *E. americanus*; (3) *dictamnus fraxinella*, a garden plant, which is said to give off so much essential oil that if a light be brought near it, it will ignite.

BURNISHER, a tool for smoothing or pressing down surfaces to close the pores or obliterate lines or marks. The engraver's burnisher is made of steel, elliptical in cross section, and coming to a dull point like a probe. Some burnishers are made of the canine teeth of dogs. Burnishers of bloodstone are used for putting gold leaf on china ware. Agate burnishers are used by bookbinders. The gilder's burnisher is of agate or porphyry.

BURNLEY, a parliamentary and municipal borough of England, in Lancashire, about 22 miles N. of Manchester. It presents a modern appearance, and is

generally speaking, well built, mostly of stone. The staple manufacture is cotton goods, and there are large cotton mills and several extensive foundries and machine shops, with collieries and other works, in the vicinity. Pop. about 110,000.

BURNS, ANTHONY, a fugitive slave, born in Virginia in 1836; arrested in Boston in 1854, under the Fugitive Slave Law. An indignation meeting, in which Theodore Parker and Wendell Phillips participated, was held in Faneuil Hall, while a premature and unsuccessful attempt to rescue Burns under the leadership of Thomas W. Higginson resulted in bloodshed and the death of one of the deputies. When the courts decided that the extradition was legal, Burns was escorted by a strong guard to a revenue cutter, and a riot was barely averted. Burns afterward regained his liberty, studied at Oberlin College, and became a Baptist minister in Canada. He died in St. Catharines, Canada, July 27, 1862.

BURNS, JAMES ALOYSIUS, a Roman Catholic clergyman and educator, born in Michigan City, Ind., in 1867. He graduated from the University of Notre Dame in 1894, and studied theology at that institution and at the Catholic University of America. He was ordained priest in 1893, and from that year to 1900 was professor of sciences at the University of Notre Dame. He became president and professor of moral theology at Holy Cross College, Washington, D. C., in 1900, serving until 1919, when he was appointed president of the University of Notre Dame. He was a founder of the Catholic Educational Association. He wrote several works on the educational system of the Catholic Church.

BURNS, JOHN, an English labor organizer and Socialist leader, born in London in 1858. He was of humble birth and became a factory boy at the age of 10. He was an omnivorous reader and imbibed his Socialistic views from a French fellow employee. By working a year as engineer on the Niger river, he earned enough for a six months' tour of Europe. He constantly addressed audiences of workingmen, and was a persistent labor agitator. He was one of the leaders in the West End riot in London, February, 1887, and was imprisoned the same year for maintaining the right of public meeting in Trafalgar Square. As an arbitrator, he is respected by employers and employed. He has been thrice elected to the London County Council and has sat in the House

of Commons since 1892. He was president of the Local Government Board (1905-1914). In 1914 he became president of the Board of Trade and resigned later in the year because of differences on the conduct of the war.

BURNS, ROBERT, the great lyric poet of Scotland, born near Ayr, Jan. 25, 1759, his father being a gardener, and later a small farmer. He was instructed in the ordinary branches of an English education by a teacher engaged by his father and a few neighbors; to these he afterward added French and a little mathematics. But most of his education was got from the general reading of books, to which he gave himself with



ROBERT BURNS

passion. In this manner he learned what the best English poets might teach him, and cultivated the instincts for poetry which had been implanted in his nature. At an early age, he had to assist in the labors of the farm, and when only 15 years old he had almost to do the work of a man. His father dying in 1784, he took a small farm (Mossgiel), in conjunction with his younger brother Gilbert. He now began to produce poetical pieces which attracted the notice of his neighbors and gained him considerable reputation. His first lines had been written some time previously, having been inspired by love, a passion to which he was peculiarly sus-

ceptible. An attachment formed by the poet for a local belle, Jean Armour, rendered his position so uncomfortable that he determined to emigrate to Jamaica, and engaged himself as assistant overseer on a plantation there. To obtain the funds necessary for the voyage, he was induced to publish, by subscription, a volume of his poetical effusions. It was printed at Kilmarnock in 1786, and Burns, having thus obtained the assistance he expected, was about to set sail from his native land, when he was drawn to Edinburgh by a letter from Dr. Blacklock to an Ayrshire friend of his and the poet, recommending that he should take advantage of the general admiration his poems had excited, and publish a new edition of them. This advice was eagerly adopted, and the result exceeded his most sanguine expectations. After remaining more than a year in the Scottish metropolis, admired, flattered, and caressed by persons of rank, fortune, or talents, he retired to the country with the sum of some £500, which he had realized by the second publication of his poems. A part of this sum he advanced to his brother, and with the remainder took a considerable farm (Ellisland) near Dumfries, to which he subsequently added the office of exciseman. He now married Jean Armour. But the farming at Ellisland was not a success, and in about three years Burns removed to Dumfries and relied on his employment as an exciseman alone. He continued to exercise his pen, particularly in the composition of a number of beautiful songs adapted to old Scottish tunes. But his residence in Dumfries, and the society of the idle and the dissipated who gathered around him there, attracted by the brilliant wit that gave its charm to their convivialities, had an evil effect on Burns, whom disappointment and misfortune were now making somewhat reckless. In the winter of 1795 his constitution, broken by cares, irregularities, and passions, fell into premature decline, and, on July 21, 1796, a rheumatic fever terminated his life and sufferings at the early age of 37. His character, though marred by imprudence, was never contaminated by duplicity or meanness. He was an honest, proud, warm-hearted man, combining sound understanding with high passions and a vigorous and excursive imagination. He was alive to every species of emotion; and he is one of the few poets who have at once excelled in humor, in tenderness, and in sublimity.

BURNS and **SCALDS**, injuries produced by the application of excessive heat to the human body. They are gen-

erally dangerous in proportion to the extent of surface they cover, and a widespread scald may cause serious consequences on account of the nervous shock. Congestion of the brain, pneumonia, inflammation of the bowels, or lockjaw may result from an extensive burn. Hence, the treatment requires to be both local and constitutional. If there is shivering or exhaustion, hot brandy and water may be given with good effect, and if there is much pain, a sedative solution of opium. The local treatment consists in dredging the burn with fine wheat flour, and then wrapping it up in cotton wool. An application of equal quantities of olive oil and lime water, called carron oil, is much recommended by some, the part being afterward covered by cotton wool. The main thing is to keep the air from the injured part, and, therefore, when a blister forms, although it may be pricked, the loose skin should not be removed.

BURNSIDE, AMBROSE EVERETT, an American military officer, born in Liberty, Ind., May 23, 1824; he graduated from West Point in 1847. He left the army as First Lieutenant, in 1852, but returned as Colonel of Volunteers, in 1861, commanded a brigade at Bull Run, and, in February, 1862, captured Roanoke Island. Having rendered important services at South Mountain and Antietam, he, in November, reluctantly superseded General McClellan. On December 13, he crossed the Rappahannock, and attacked General Lee near Fredericksburg, but was repulsed with a loss of over 10,000 men, and was soon after transferred to the Department of Ohio. In November, 1863, he successfully held Knoxville against a superior force, and, in 1864, he led a corps, under General Grant, through the battles of the Wilderness and Cold Harbor. Resigning in April, 1865, he was elected Governor of Rhode Island (1866-1868), and United States Senator in 1875 and 1881. He died in Bristol, R. I., Sept. 13, 1881.

BURR, AARON, an American statesman, and third Vice-President of the United States, born in Newark, N. J., Feb. 5, 1756. His father was the President of Princeton College. He entered Princeton College at the age of 12 and graduated at 16. While in his 20th year, before he had completed his preparation for the bar, to which he had determined to devote himself, he joined, in 1775, the American army, under Washington, at Cambridge. His ardor in behalf of the Revolutionary cause was such that he was induced to join Arnold as a volunteer in the expedition against Quebec. After his arrival there he was

appointed aide-de-camp to Montgomery, and was by the side of that officer when he fell. Subsequently, in 1776, he was received by General Washington as one of his military family, but was soon cast off in consequence of his debauchery. He never forgave Washington this act. Burr's military talents, however, secured for him the post of Lieutenant-Colonel, in 1777, which he retained until 1779,



AARON BURR

when he was obliged to relinquish it in consequence of ill health. Upon Burr's retirement from military life, he resumed the study of law, and commenced its practice in Albany, in 1782, but soon removed to New York, where he early acquired a prominent position as a great lawyer. In 1789 he was made attorney-general of New York. From 1791 to 1797, he was a member of the United States Senate, where he was distinguished as a leader of the Republican party. In 1800 he was a candidate for the Presidency, and received the same number of votes as Thomas Jefferson (79), and the choice was thus left to the decision of Congress, which, on the 36th ballot, elected Jefferson as President and Burr as Vice-President. In 1804 was fought the famous duel between Alexander Hamilton and Burr, in which the

former was killed and the latter forever lost the public esteem. In 1807 he was apprehended, taken to Richmond, Va., and tried on a charge of a treasonable design upon Mexico; he was, however, after a long trial acquitted. His public life was now at an end, as his country had no faith in his integrity; he, however, resumed the practice of law, but lived in comparative obscurity until his death on Staten Island, Sept. 14, 1836.

BURR, GEORGE WASHINGTON, an American soldier, born in Tolono, Ill., in 1865. He graduated from the United States Military Academy in 1888 and the same year was appointed first lieutenant of the artillery. He rose to various grades, reaching that of temporary brigadier-general in 1918. In the following year he was appointed major-general. He served as instructor in several military colleges and in the Philippines, where for a time he was chief ordnance officer of the Philippines Division. He was appointed chief ordnance officer of the Central Department in 1911, serving until 1918. In the latter year, he became chief ordnance officer for the American forces in England. In October of that year he was appointed chief of the engineering division of the Ordnance Department, and later became assistant director of the purchase, storage, and traffic departments of the General Staff. He was a member of the War Department Claims Board from January, 1919.

BURRARD INLET, an inlet of British Columbia, forming a fine harbor and having Vancouver, the terminus of the Canadian Pacific Railway, on its southern shore.

BURRILLVILLE, a town of Rhode Island, in Providence co., on the New York, New Haven, and Hartford railroad. Its chief industry is the manufacture of woolen goods. Wallum Lake, near the city, is a favorite summer resort. Pop. (1910) 7,878; (1920) 8,606.

BURRITT, ELIHU, an American author, called the "Learned Blacksmith," born in New Britain, Conn., Dec. 8, 1811. He was a blacksmith, linguist, lecturer, reformer and a noted advocate of peace. His books include "Sparks from the Anvil" (1848) "Olive Leaves" (1853); and "Chips from Many Blocks" (1878). See Charles Northend's "Life of Elihu Burritt" (New York, 1879). He died in New Britain, March 7, 1879.

BURROUGHS, BRYSON, an American artist, born in Hyde Park, Mass., in 1869. He was educated in the public schools and studied art at the Art Stu-

dent's League. He afterward carried on art studies in Paris and Florence. He won silver medals at the Buffalo and Pittsburgh Expositions. He was curator of paintings at the Metropolitan Museum of Art and was associate at the National Academy.

BURROUGHS, JOHN, an American essayist and descriptive writer, born in Roxbury, N. Y., April 3, 1837. He became a clerk in the Treasury Department and subsequently a National Bank Examiner. In 1874 he settled on a farm in New York State and has since de-



JOHN BURROUGHS

voted himself to nature study and literature. His books on rural themes include, "Wake Robin" (1871); "Winter Sunshine" (1875); "Birds and Poets" (1877); "Locusts and Wild Honey" (1879); "Pepacton; Notes of a Walker" (1881); "Fresh Fields" (1884); "Signs and Seasons" (1886); and "Sharp Eyes" (1888); "Far and Near" (1904); "Ways of Nature" (1905); "Bird and Bough" (1906); "The Summer of the Years" (1913); "Field and Study" (1919); etc. He also wrote "Notes on Walt Whitman" (1867); and "Whitman: a Study" (1897); contributed frequently to various magazines. He died on March 29, 1921.

BURSLEM, a town of England, in Staffordshire, in the center of "The Potteries." Here is the Wedgwood Memorial Institute, comprising a free

library, a museum, and a school of art, erected in honor of Josiah Wedgwood, who was born at Burslem in 1730. Burslem has extensive manufactures of china and earthenware, in which trade and coal mining the inhabitants are chiefly employed. Pop. about 45,000.

BURTON, MARION LEROY, an American educator, born in Brooklyn, Ia., in 1874. He graduated from Carleton College in 1900 and took post-graduate studies at Yale. After teaching at several institutions he became assistant professor at Yale in 1907. He was pastor of the Church of the Pilgrims at Brooklyn in the following year, and in 1900 was elected president of Smith College. He held this position until 1917, when he was chosen president of the University of Minnesota. In July, 1920, he became president of the University of Michigan. He was a trustee of the Carnegie Foundation and was a member of many learned societies. He was the author of "The Problem of Evil" (1909); "First Things" (1915); "On Being Divine" (1916).

BURTON, RICHARD (EUGENE), an American poet and educator, born in Hartford, Conn., March 14, 1859. He graduated from Trinity College, Hartford, and took a degree at Johns Hopkins University. He was active as editor of various publications and was head of the English department at the University of Minnesota from 1898-1902, and again since 1906. His published poems are "Dumb in June" (1895); "Memorial Day" (1897); "Message and Melody" (1903); "From the Book of Life" (1909); etc. He also wrote several volumes of essays, plays, and fiction.

BURTON, SIR RICHARD FRANCIS, an English Orientalist and explorer, born in Hertfordshire, March 19, 1821. He was an officer of the Indian army, for several years engaged in surveys for public works; in this pursuit he learned the languages, habits, beliefs of many races. Obtaining leave of absence, he went to Mecca and Medina in the guise of a Mohammedan devotee; afterward he made extensive explorations in Africa, Brazil, Syria, Iceland; visited the United States twice and traversed the country from Atlantic to Pacific. His books of travel include "Pilgrimage to El Medinah," "Highlands of Brazil," "Gold Coast," "City of the Saints," "Unexplored Palestine." He translated into English from the Arabic, "The Thousand Nights and a Night," and "The Scented Garden," a collection of stories left in MS. and never published. He wrote a "Life of Camoens," with translation

of the "Lusiads." He died in Trieste, Oct. 20, 1890.

BURTON, ROBERT, an English writer, born at Lindley, Leicestershire, Feb. 8, 1577. Obtaining two church livings, he resided at Christ Church, Oxford. Here he wrote the "Anatomy of Melancholy" (published about 1621); a vast storehouse of shrewd comment, apt and learned quotation, humor, and erudition, from which Milton, Sterne, and others did not scruple to borrow. The work mirrors his own mind and temperament. He died at Oxford, Jan. 25, 1640.

BURTON, THEODORE ELIJAH, an American senator; born in Jefferson, O., in 1851. He was educated at Oberlin College, from which he graduated in 1872. Three years later he was admitted to the bar and practiced law at Cleveland, O. He was a member of the 51st Congress, 1889-1891, and served in successive Congresses from 1895 to 1909. In the latter year he became United States senator, serving until 1915. He has written "Financial Crises and Periods of Industrial and Commercial Depression" (1902); "Life of John Sherman" (1906); "Corporations and the State" (1911); etc.

BURTON-ON-TRENT, a town of England in the counties of Stafford and Derby, 22 miles E. of Stafford, and 128 N. N. W. of London. It is famous, all the world over, for its ale. Brewing is conducted here on the most extensive scale; and the India pale ale, made by the great firms of Bass and Allsopp, bears a noted reputation both at home and abroad, more especially in India, its greatest market. Pop. about 50,000.

BURU (bur-ö'), or **BOEROE**, an island of the Malay Archipelago, in the residency of Amboyna, from which it lies about 40 miles to the W. Area, with the small island of Ambalau, 3,360 square miles; population about 15,000. The marshy coast lands are notoriously unhealthful, but lofty mountains rise in the interior, one peak (Tomahoe) attaining an altitude of 8,530 feet. A dense natural forest covers most of the country, and only a very small portion has been brought under cultivation. The soil is rich, and vegetation everywhere luxuriant. Capital, Cajeli.

BURY, a municipal and parliamentary borough of England, in Lancashire, 8 miles N. N. W. of Manchester, well situated on rising ground between the Irwell and the Roche. The staple manufacture is cotton, and there are also large woolen factories, bleaching and printing works, dye works, foundries,

etc. Sir Robert Peel was born near Bury in 1788, and a bronze statue of him adorns the town. Pop. about 60,000.

BURY ST. EDMUND'S, or **ST. EDMUNDSBURY**, a parliamentary and municipal borough in Suffolk, England, well built and delightfully situated on the Larke, 26 miles from Ipswich. Agricultural implements are manufactured, and there is a large trade in agricultural produce. Bury St. Edmund's is an ancient place, and derived its name from St. Edmund, a King of the East Angles, slain by the heathen Danes and buried here. It contains the remains of an abbey, once the most wealthy and magnificent in Great Britain. Pop. about 17,000.

BUSACO (bö-sä'kō), a ridge (1,826 feet) on the N. side of the river Mondego, in the Portuguese province of Beira, 16 miles N. N. E. of Coimbra. Here Wellington, with 40,000 British and Portuguese troops, repulsed the attack of Masséna with 65,000 French, Sept. 27, 1810.

BUSH, IRVING T., an American capitalist, born in Ridgeway, Mich., in 1869. He received an academic education. At the age of 19 he began business in the firm of his father. In 1895 he began the establishment of warehouses in New York City under the title of The Bush Co., Ltd. He founded the Bush Terminal Company in 1902, which developed into the Bush Terminal with 125 warehouses and 8 piers in New York City. These provided facilities for the business of over 250 manufacturing wholesale establishments. He was a member of many economic societies. During the war he performed valuable services in an advisory capacity.

BUSH ANTELOPE, also called **BUSH BUCK**, and **BUSH GOAT**, names common to a number of species of ANTELOPE (*q. v.*), natives chiefly of the southern and western parts of Africa. According to some naturalists, they form a distinct genus (*cephalophus*). They are animals of more compact form, shorter limbs, and greater strength, but much less agility, than the true or typical antelopes. They are remarkable for the arched form of the back. They have short, straight, or slightly curved horns, situated far back, and often peculiar to the male sex, with usually a long tuft of hair between them. They have no tear pits, but, instead of them, a naked glandular furrow, formed of two series of pores, on each cheek. They frequent jungles, thick forests and beds of reeds, and, when pursued, seek to escape by

diving into a thicket. The commonest species is the duiker (*C. mergens*), living in pairs in the bushy districts of south Africa.

BUSHEL, a measure of capacity used for grain; or what is called dry measure. It contains 64 pints, 32 quarts, or 4 pecks. In the United States it is equal to 2150.42 cu. in., in Great Britain to 2218.2 cu. in.

BUSHIRE, or ABUSHEHR ("father of cities," also variously written Bushahr; in Persian, Bendershehr), a port of Persia, on a sandy peninsula on the E. shore of the Persian Gulf, in the province of Fars. The climate is most unwholesome. It is the land terminus of the Indo-European telegraph line. It has lost much of its former importance as a trade center, its harbor being neither deep nor safe. Pop. about 2,000.

BUSHMEN, a nomadic race of Africa. They are a thin, wiry people, poor and debased near the coast, but greatly improved further inland. They recognize no king or chief, build no houses, have no cattle or goats, do not till the soil, and wear skins for clothing. Their language has a rough, clicking sound, and they resemble the Hottentots.

BUSHNELL, HORACE, an American clergyman, born near Litchfield, Conn., in 1802. He was pastor of a Congregational Church in Hartford until 1859. His numerous works on religion, theology, and morals, and other topics, include "Christian Nurture," "God in Christ," "Christ in Theology," "The Vicarious Sacrifice," "Nature and the Supernatural," "Forgiveness and Law," "Moral Tendencies and Results of Human History," "The Character of Jesus," "Work and Play," "Christ and His Salvation," "Politics the Law of God," etc. He died in Hartford, Conn., Feb. 17, 1876.

BUSHRANGERS, in Australia, originally convicts from the English penal stations who took to the bush and became robbers. The thickly wooded mountainous districts afforded them protection, and they soon established a reign of terror. They became so strong that the government had to adopt the most stringent measures to suppress them.

BUSIRIS, a town of ancient Egypt, in the Delta, the chief place where the rites of Osiris were celebrated. The name is also given as that of a mythical Egyptian King.

BUSONI, FERRUCCIO BENVENUTO, an Italian pianist and composer, born near Florence, in 1866. He received his

chief musical education from his father and mother, who were both talented musicians. He won prizes for composition and piano playing and was appointed professor at the Conservatory of Moscow. From 1891 to 1893 he taught at the New England Conservatory of Music in Boston. He removed in 1894 to Berlin, and in the year following made extensive concert tours through Europe and the United States. He was considered to be one of the masters of the piano. In 1913 he was appointed director of the Conservatory of Bologna. His musical compositions have great merit.

BUST, in sculpture, the representation of that portion of the human figure which comprises the head and the upper part of the body. During the literary period of Greece the portrait busts of the learned formed an important branch of art, and in this way we come to possess faithful likenesses of Socrates, Plato, Demosthenes, etc., in which the artists show great power of expressing the character of those represented. The number of busts belonging to the time of the Roman Empire is very considerable, but those of the Roman poets and men of letters have not been preserved in nearly so large numbers as those of the Greeks. The first bust that can be depended upon as giving a correct likeness is that of Scipio Africanus the Elder.

BUSTAMANTE, ANASTASIO, a Mexican statesman and revolutionist, born in Jiquilpan, Michoacan, July 27, 1780. In 1808 he joined the Spanish army, and, for a time, fought against the party of the revolutionists, but in 1821 he acted with Iturbide. He was made Vice-President and commander of the army, in the administration of Guerrero, 1829. He afterward revolted and led the Centralist party, and in 1830 became acting President of Mexico. In 1832 Santa Anna opposed him at the head of an army, and he was conquered and banished (1833). When the Centralist party returned to power he was recalled, and in 1837 was elected President of Mexico. In 1842 he was obliged to retire from the Presidency, and was succeeded by Santa Anna. He served in the Mexican army in the war with the United States, retiring from military service in 1848. He died in San Miguel de Allende, Feb. 6, 1853.

BUSTARD, the name of a genus of European birds, the otis, which is the typical one of the family *otitidae*. The great bustard (*O. tarda*), the little bustard (*O. tetrix*), and Macqueen's bustard

(*O. macqueeni*) are the best known species. The great bustard was formerly common in Wiltshire and in Norfolk, England. It has the plumage on the back of a bright yellow traversed by a number of black bars, the rest of the



LITTLE BUSTARD

plumage being grayish. It runs and flies well. It is still common in parts of the European Continent. The little bustard (*O. tetrix*) is a Mediterranean bird. It is brown dotted with black above, and beneath is whitish. The male has a black neck with two white collars.

BUTCHER BIRD, one of the English names of the genus *lanius*. The species are so denominated because they impale on a thorn the small birds, small quadrupeds, insects, and worms on which they feed. They are also called shrikes.

BUTE, an island of Scotland in the estuary of the Clyde, with an area of 60 square miles, belonging principally to the Marquis of Bute. It is about 15 miles long, and the average breadth is $3\frac{1}{2}$ miles. In Kames Hill it rises to the height of 875 feet; it has several pretty lakes, the principal of which is Loch Fad, $2\frac{1}{4}$ miles long. Agriculture is in an advanced state, and there are about 20,000 acres under cultivation. The herring fishery is also a source of considerable profit. The only town is Rothesay, whose ancient castle is one of the interesting antiquities of the island. The climate of Bute is milder than that of almost any part of Scotland. The county of Bute comprises the islands of

Bute, Arran, Great Cumbrae, Little Cumbrae, Inchmarnock, and Pladda, with a total area of 139,658 acres, but only a small part is under cultivation. Arran is about double the size of Bute, but the other islands belonging to the county are small. Pop. about 18,000.

BUTLER, a borough of Pennsylvania, the county-seat of Butler co. It is on Conequenessing creek, and on the Pennsylvania, the Pittsburgh and Western, the Buffalo, Rochester, and Pittsburgh, and the Bessemer and Lake Erie railroads. It is the center of an important mining and natural gas region. The chief industries are the manufacturing of cars, glass, flour, silk, brass and iron beds, etc. There is a court house, a hospital, parks, and a public library. Pop. (1910) 20,728; (1920) 23,778.

BUTLER, BENJAMIN FRANKLIN, an American lawyer and soldier, born in Deerfield, N. H., Nov. 5, 1818; studied law, and was admitted to the bar in 1841, and became distinguished as a criminal lawyer and politician. He was a member of the State Legislature in 1853, of the State Senate in 1859-1860, and a delegate to the Democratic National Convention of 1860, which met at Charleston and adjourned to Baltimore. He supported the nomination of John C. Breckenridge, which rendered him so unpopular in the North that he was defeated for Governor of Massachusetts in that year. Butler had risen to the rank of Brigadier-General of militia; and, at the outbreak of the Civil War, he marched with the 8th Massachusetts Regiment, and, after a check at Big Bethel, was appointed to the command of Baltimore and of eastern Virginia, with his headquarters at Fort Monroe. In February, 1862, he commanded the military forces sent from Boston to Ship Island, near the mouth of the Mississippi; and, after New Orleans had surrendered to the naval forces under Farragut, he held military possession of the city. Relieved of his command, he acted under Gen. Grant in his operations against Petersburg and Richmond in 1865. Returning to Massachusetts at the end of the war, he took an active part in politics as an extreme radical, advocated the impeachment of President Johnson, and in 1866-1875 was a member of Congress. In 1877 and 1879 he was defeated as candidate for Governor of Massachusetts, but in 1882 was elected by a large majority. In 1884 he ran for the Presidency as the candidate of the Greenback and Anti-Monopolist parties, but was defeated, carrying no State. He published "The Autobiography and Personal Reminiscences of Maj.-Gen. Benja-

min F. Butler" (1892). He died in Washington, D. C., Jan. 11, 1893.

BUTLER, ELLIS PARKER, an American author; born in Muscatine, Ia., in 1869. The vein of humor that he opened up in his writings, dating from the publication of "Pigs Is Pigs" in 1906, appealed strongly to the public, and his books and magazine articles have proved very popular. Among the best known of his books are "The Incubator Baby" (1906); "Cheerful Smugglers" (1908); "Adventures of a Suburbanite" (1911); "The Jack-Knife Man" (1913); and "Dominie Dean, a Tale of the Mississippi" (1917).

BUTLER, HOWARD CROSBY, American educator and archæologist; born in Croton Falls, N. Y., March 7, 1872. He graduated from Princeton University, and later pursued special studies at the Columbia School of Architecture and at the American Schools of Classical Studies in Rome and in Athens. In 1899, 1904, and 1909, he was at the head of archæological expeditions in Syria. He became professor of the history of architecture at Princeton in 1905. He wrote many articles for archæological journals and notable books on "Scotland's Ruined Abbeys" (1900) and "The Story of Athens" (1902).

BUTLER, NICHOLAS MURRAY, an American educator, born in Elizabeth, N. J., April 2, 1862. He was graduated at Columbia in 1882, where he became Assistant in Philosophy (1885), Adjunct Professor (1886), Dean of Faculty of Philosophy (1889), and Professor of Philosophy and Education (1890). He founded the New York College for Training of Teachers, and has written works on education. He became President of Columbia University in 1902. In recent years he was very active in the affairs of the Republican party, being prominently mentioned as a candidate for the Presidency in 1920. He was a member of many domestic and foreign learned societies, received numerous honorary degrees and foreign decorations, and published many addresses, essays, and reviews.

BUTLER, SAMUEL, an English satirist, born in Strensham, Worcestershire, in February, 1612. He was educated at Oxford or Cambridge, occupied his leisure in studying music and painting, became a man of wide and curious learning, and gained his living as secretary and clerk to aristocratic personages. His famous poem, "Hudibras," a witty and sharp satire on the Puritans, secured instant favor with the King and the public; yet after the appearance of

the first part in 1663, he spent 17 years in poverty and obscurity. The second and third divisions of "Hudibras" appeared in 1664 and 1678. The general design of the great poem was derived from "Don Quixote." The situations of the mock epic are few but ludicrous, and the whole canvas is embellished with imagination, raillery, subtle casuistry, brilliant epigrams, and sparkling wit. He died in London, Sept. 25, 1680.

BUTLER COLLEGE, a coeducational institution, in Indianapolis, Ind.; organized in 1855; reported at the end of 1919: Professors and instructors, 24; students, 756; volumes in the library, 15,000; president, T. C. Howe, Ph. D.

BUTT, ISAAC, an Irish patriot; the first to make political use of the phrase "Home Rule"; was the son of a Protestant rector, and was born in County Donegal, Sept. 16, 1813. Educated at Raphoe and at Trinity College, Dublin, he gained a brilliant reputation for his accomplished scholarship. In 1852 he was elected to Parliament as a Liberal Conservative for Youghal, for which constituency he sat until 1865. He defended Smith O'Brien and others in the State trials of 1848, and, with equal fearlessness and self-devotion, all the Fenian prisoners between the years 1865 and 1869. In 1871 he was elected for the city of Limerick to lead the Home Rule party, but soon found that he could not control them. He died May 5, 1879.

BUTTE, a French word used in the United States for an abrupt, and usually isolated, eminence, sometimes appearing in the form of a lofty turret. They occur in picturesque grandeur along the banks of the Columbia river, in Oregon, and in the neighborhood of Butte, Mont.

BUTTE, a city and county-seat of Silverbow co., Mont.; on the Great Northern, the Northern Pacific, and other railroads. It is one of the largest mining towns in the world, the mining industry being principally confined to copper mining, although there are valuable gold and silver mines. The Anaconda copper mines are located here. The city is the trade and jobbing center for southern and western Montana; has an extensive trolley system; gas and electric lights; National banks; public library; daily and weekly periodicals, the State School of Mines, etc. Pop. (1910) 39,165; (1920) 41,611.

BUTTER, a fatty substance obtained from milk. Although occasionally made from the milk of goats, buffaloes, etc., it is commonly made from cow's milk. It was used by the ancients as a fuel or

as an ointment, or hair dressing, but is now used almost wholly as a food. The composition of cow's milk shows wide variations, but an average analysis is as follows: Fat, 3.65 per cent.; casein, 2.88 per cent.; albumen, .53 per cent.; sugar, 4.81 per cent.; salt, .71 per cent.; water, 87.42 per cent.

As here seen, the amount of fat is between 3 per cent. and 4 per cent., and this fat, when separated from most of the other ingredients, forms butter. When of good quality, butter has a peculiar but delicate odor (aroma) and a pleasant flavor. The characters of aroma and flavor differ, however, very much, according to the conditions and methods of manufacture, and they also differ widely with the locality where the butter is made, depending largely upon the taste of the consumer. For example, the people of European countries, in general, are fond of a very mildly flavored butter, and such is found in their markets. In the United States there is a demand for a stronger flavor, and this is produced; while in certain tropical countries a very strong flavor—amounting to a rancid taste—is desired, and hence this is characteristic of much of the butter used in the tropics.

In former years all butter was made in small quantities, upon individual farms; but the tendency to concentration has affected this as well as other industries. To-day a larger and larger proportion of it is being made in butter factories, or creameries, as they are called in the United States. These factories receive the milk and cream from many neighboring farms, and make the butter in very large quantities, one factory in Vermont reaching 20,000 pounds per day. In such large institutions the whole process can, of course, be more carefully controlled than on individual farms, and the butter is generally better and more uniform in character. The temperature of the cream can be regulated by means of steam and ice, and the mixture of large amounts of cream from various sources tends to produce more uniformity in the butter than when it is made from the cream of a single farm. The creameries are increasing in number every year and they seem destined to absorb into themselves all the butter-making industry.

The great butter-making countries of the world are the United States, Denmark, Sweden, England, Ireland, and Australia. England imports large quantities from Canada, the United States, and Denmark, as well as from Australia. The United States is an exporting country. The southern countries make much less butter and consume less than the

northern countries. In the south, oils, such as olive oil, take, to a considerable extent, the place of butter, and, among the poorer classes, butter is an almost unknown article of diet. During the World War butter was one of the commodities which rose greatly in price, and its use was to a large extent superseded by substitutes. In England butter was rationed long after the conclusion of peace.

Certain vegetable oils which are solid at ordinary temperatures, such as palm oil, cocoanut oil, nutmeg oil, etc., are frequently called vegetable butter, and the name mineral butter has sometimes been applied to substances which are wholly different in nature. The word butter has also been used in the names which have been given to various brands of oleomargarine products, e. g., butterine, etc.

BUTTERCUP, the popular name of two or three species of the ranunculus, namely, *R. acris*, *R. bulbosus*, and *R. repens*. They are common plants with brilliant yellow flowers.

BUTTERFIELD, DANIEL, an American soldier, born in Utica, N. Y., Oct. 18, 1831. At the outbreak of the Civil War he was Colonel of the 12th New York Militia. He served in the Peninsular campaign, and under Pope and McClellan in 1862. At Fredericksburg he commanded the 5th Corps, and at Chancellorsville and Gettysburg was chief of staff. He served as chief of staff to Hooker at Lookout Mountain, and Ringgold, and Pea Vine Creek; and commanded a division at Buzzard's Roost, Resaca, Dallas, New Hope Church, Kenesaw, Lost Mountain, and other battles. He was brevetted Major-General in the regular army. He resigned in 1869, and became chief of the United States sub-treasury in New York City. He is author of "Camp and Outpost Duty" (1862). He died in 1901.

BUTTERFIELD, KENYON LEECH, an American educator, born in Lapeer, Mich., in 1868. He graduated from the University of Michigan and took a special course at the Michigan Agricultural College. He became editor of the "Michigan Grange Visitor" in 1892. He was superintendent of the Michigan Farmers' Institute and field agent of the Michigan Agricultural College from 1895 to 1899. In 1903 he was chosen president of the Rhode Island College of Agriculture and Mechanical Arts. Three years later he became president of the Agricultural College of Massachusetts. In 1916-1917 he was president of the Association of American Agricultural Col-

leges and Experiment Stations, and in 1917-1918 chairman of the Massachusetts Committee of Food Production and Conservation. He also served on many other committees of a similar nature. Apart from articles in periodicals, his chief work is "The Country Church and the Rural Problem" (1911).

BUTTERFLY, the English name for any species of the diurnal *lepidoptera*, or *rhopalocera*. The antennæ end in a club; the wings in repose are generally quite upright, and there are no bristles on the hinder pair. They fly by day, while their allies the hawk moths do so by twilight, and the moths by night. Before coming to the perfect state they exist first as the caterpillar, and afterward in the chrysalis state. Butterflies exist in all climates except those marked by extreme cold; the tropical species, are, however, most numerous, besides being the largest in size, and, as a rule, the brightest in coloring. The butterflies, or diurnal *lepidoptera*, are divided into four families: *Papilionidae*, *nymphalidæ*, *lycaenidæ*, and *hesperidæ*.

BUTTERINE. See OLEOMARGARINE.

BUTTERMILK, the residue of cream after the butter has been removed by churning. It forms a wholesome and agreeable as well as a nourishing drink in hot weather. It possesses the slightly acid taste from the acidity developed in ripening the cream. In composition it retains the ash ingredients, casein, and sugar of ordinary milk, while, on account of small particles of butter being left in it, it is not devoid of fatty matter. When the whole milk is churned, the resulting buttermilk is inferior both in taste and quality. In the country districts of both Ireland and Scotland it is commonly taken with porridge or potatoes. Buttermilk is light and digestible, and is used as a beverage in the treatment of certain diseases.

BUTTERNUT, the fruit of *Juglans cineræa*, or white walnut, an American tree, so called from the oil it contains. The tree bears a resemblance in its general appearance to the black walnut, but the wood is not so dark in color. The same name is given to the nut of *Caryocar butyraceum* and *C. nuciferum* of South America, also known as suwarro, or suwarra nut.

BUTTERWORT, *pinguicula vulgæris*, order *lentibulariaceæ*, a plant growing in bogs or soft grounds in Europe, Canada, etc. The leaves are covered with soft, pellucid, glandular hairs, which secrete a glutinous liquor that catches small insects. The edges of the leaf roll

over on the insect and retain it, and the insect thus retained serves as food for the plant. In the N. of Sweden the leaves are employed to curdle milk.

BUTTERWORTH, HEZEKIAH, an American story writer, born in Warren, R. I., Dec. 22, 1839. In 1871 he became editor of the "Youth's Companion." Author of popular juvenile stories and travels, including "Zig-Zag Journeys" (1876-1880); "Songs of History: Poems and Ballads upon Important Episodes in American History" (1887), and "The Wampum Belt" (1896). He died Sept. 5, 1905.

BUTTON, a small circular disk or knob of mother of pearl, horn, metal, or other material, with a shank or perforations through its center for attachment to an object, and made to fit into a hole formed in another one for its reception, the two fastening the objects together. Its chief use is to unite portions of a dress together. The ancient method of fastening dresses was by means of pins, brooches, buckles and tie-strings. Buttons of brass are found on dresses of the 16th century. Gilt buttons were first made in 1768, and those of papier mâché in 1778.

Buttons of vegetable ivory are now used universally. The palm fruit which yields it is called corozo nut. It is not unlike true ivory but softer, and is easily turned and dyed. These buttons are often mottled with some stain to suit the common patterns of cloth. Mother of pearl buttons are formed of the beautiful substance of which the large flat shell of the pearl oyster consists, and this has long been a favorite material for buttons. Small cylinders are first cut out of the shells with a tubular saw. These are then split into discs, which are shaped by a steel tool, drilled with holes, and finally polished with rotten stone and soft soap, or by a more recent method with ground charcoal and turpentine. Shirt studs as well as flat and globular buttons with metal shanks are also made of this substance.

Among other animal substances used for buttons are ivory, bone, horn, and hoof. There are many kinds of composition buttons. Glass buttons are made in great variety. Along with other varieties, some beautiful glass buttons are made in Bohemia, either partly or wholly of aventurine glass; and of this gold spangled material, artistically inwrought with other colors, studs and solitaires still more remarkable for their beauty and minute patterns are made at Venice.

Porcelain buttons were formerly nearly all of French manufacture, but they are now made principally at



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PASEO COLON, OR COLUMBUS SQUARE, IN THE HEART OF THE FINANCIAL AND EXPORTING SECTIONS OF BUENOS AIRES, ARGENTINA

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NATIVE AUSTRALIANS WITH BOOMERANGS AND OTHER WEAPONS

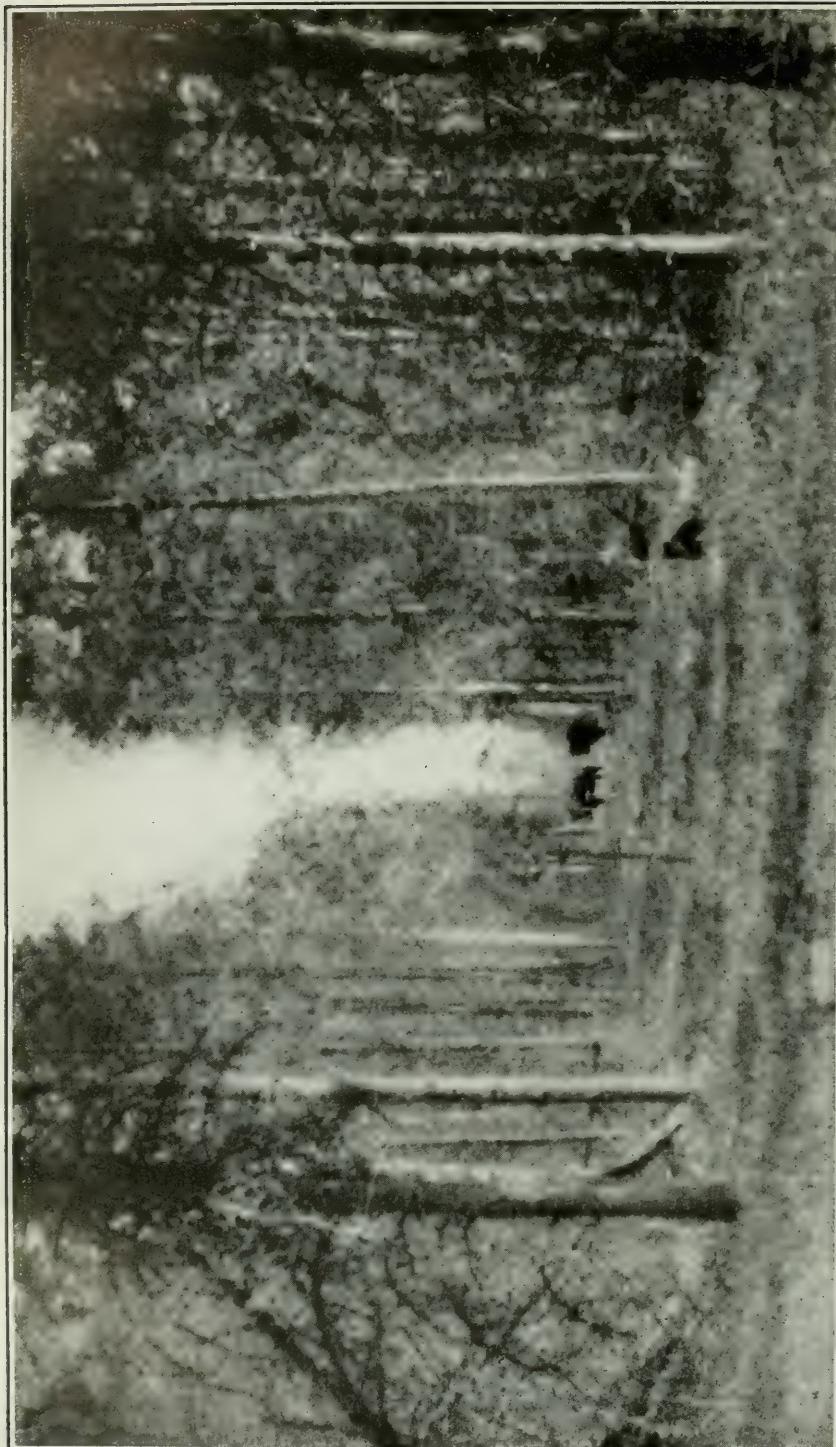
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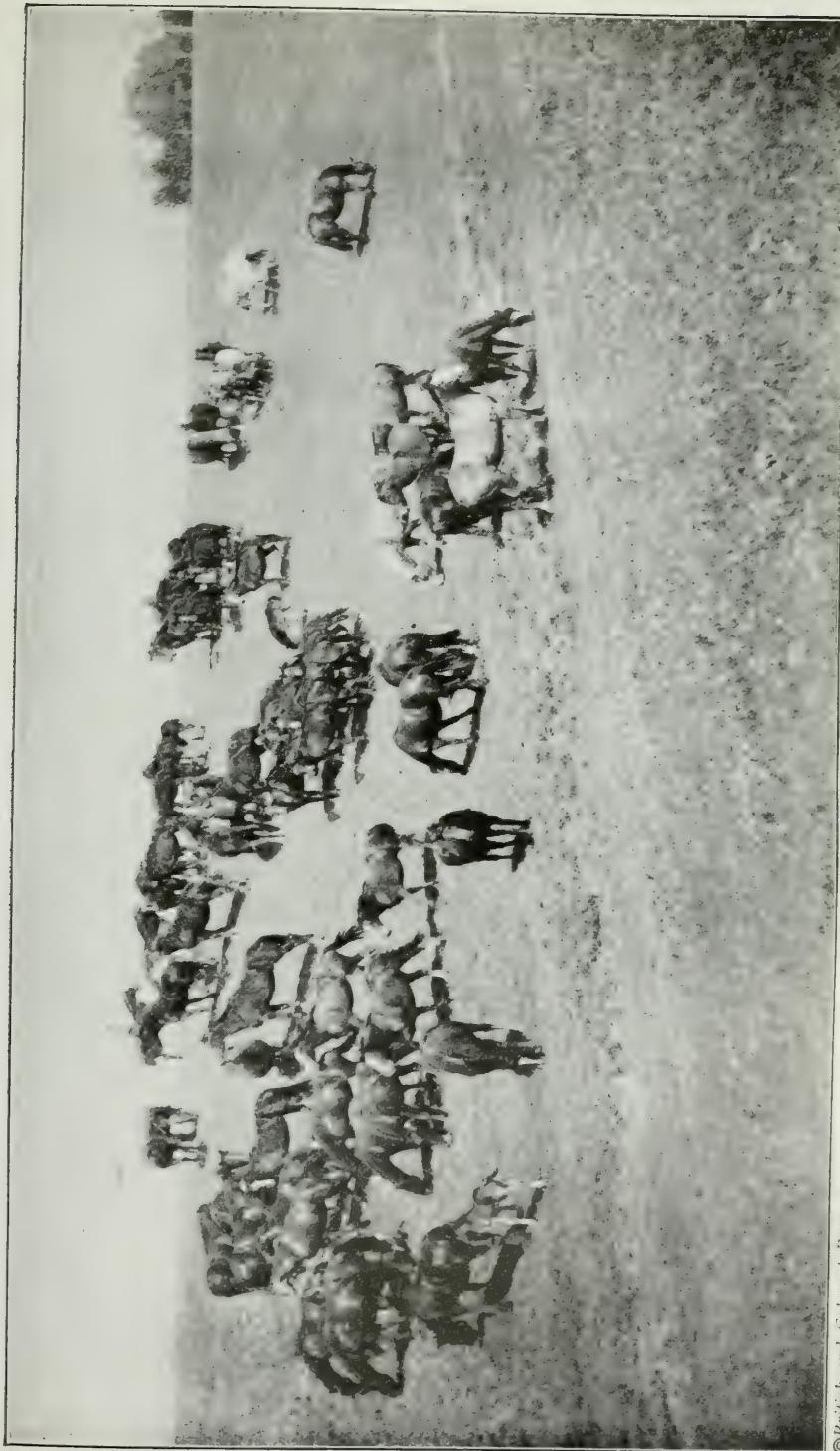


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USING ELEPHANTS FOR MOVING LUMBER IN RANGOON, BURMA



© Photo, Colonial Press Service
WILD AMERICAN BUFFALO (BISON), FOUND IN THE NORTHWESTERN FORESTS OF CANADA



©British and Colonial Press

A HORSE RANCH IN THE CANADIAN WEST

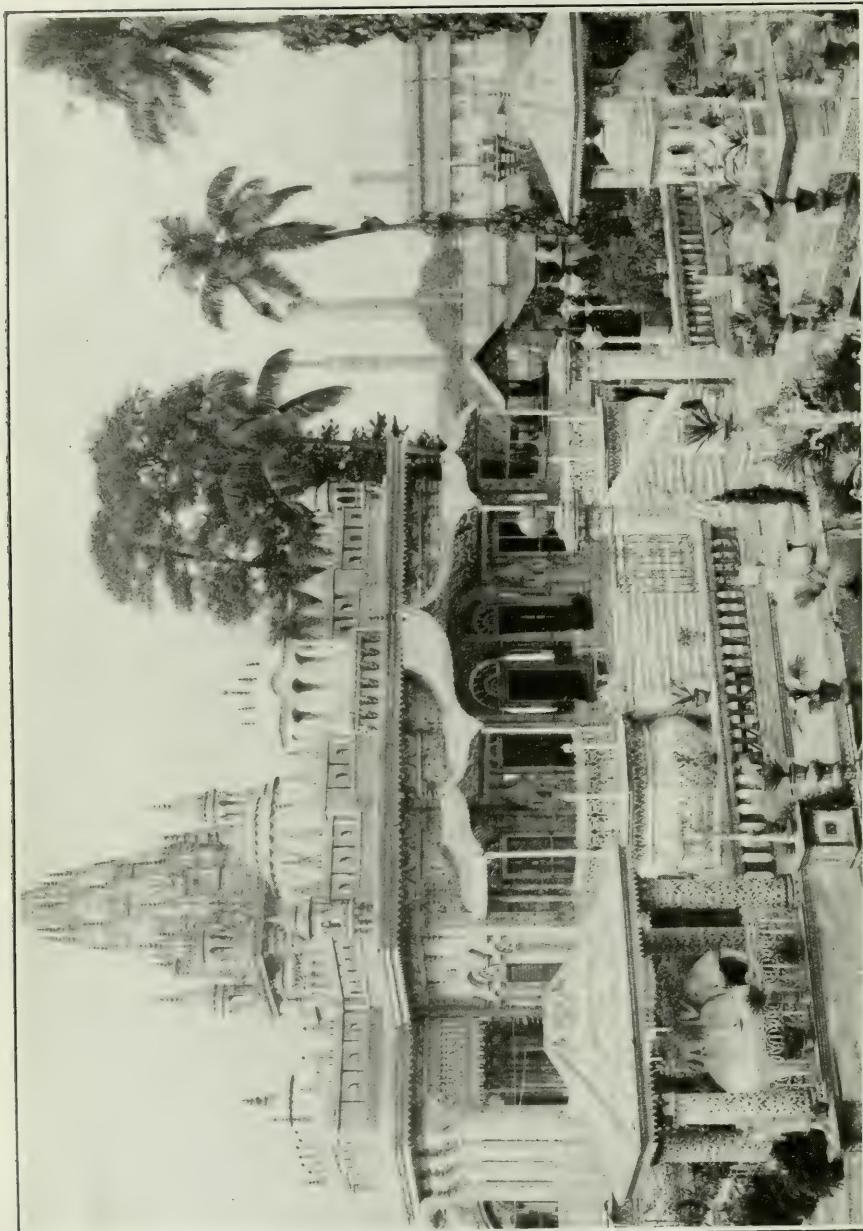


© Brown & Dawson
HARVESTING CACAO, OTHERWISE KNOWN AS COCOA OR CHOCOLATE, IN THE ISLAND OF TRINIDAD



©Photo, Ewing Galloway

A STREET IN CAIRO, EGYPT



THE BADRA DAS JAIN TEMPLE, CALCUTTA, INDIA

Prague. Some are plain and others are painted or printed with patterns. More or less expensive buttons are made of ornamental stone, such as agate, jasper, and marble. Occasionally they are formed of amber, jade, or of still more costly materials, as pearls and gems. In recent years, improved methods and machines have been introduced for the shaping as well as for the polishing and finishing of bone, corozo, and wood buttons. Machinery is now used also for the manufacture of composition buttons, and there are machines for performing automatically all the operations in manufacturing covered buttons. In England, Birmingham is the seat of the button trade, which, however, is much more largely developed in France and in Germany, where the manufacture of buttons has made great strides in recent years. In the United States, buttons are principally made in New York and Philadelphia, but there are also numerous establishments in other localities.

BUTTRESSES, in architecture, especially Gothic, projections on the outside of the walls of an edifice, extending from the bottom to the top, or nearly, and intended to give additional support to the walls and prevent them from spreading under the weight of the roof. Flying buttresses, of a somewhat arched form, often spring from the top of the ordinary buttresses, leaning inward so as to abut against and support a higher portion of the building, such as the wall of a clear story, thus receiving part of the pressure from the weight of the roof of the central pile.

BUTTRICK, WALLACE, an American educator, born in Potsdam, N. Y., in 1853. He was educated at the Ogdensburg Academy and the Potsdam Normal School. He graduated from the Rochester Theological Seminary in 1883, and in the same year he was ordained to the Baptist ministry. He filled several pastorates until 1902, when he was appointed secretary of the General Educational Board. In 1907 he was elected president of the Board.

BUTTZ, HENRY ANSON, an American educator, born in Middle Smithfield, Penn., April 18, 1835. He was graduated at Princeton, in 1858, and entered the Methodist ministry in 1858. From 1880 to 1912 he was President of Drew Theological Seminary, and since 1912 President Emeritus. He wrote much on polemics, exegesis, and hermeneutics.

BUTYL, an organic monad, fatty radical, having the formula $(C_6H_5)_2$; also called quarty, or tetryl, from its con-

taining four carbon atoms. See ALCOHOL.

BUTYRIC ACID, an acid obtained from butter; it also occurs in perspiration, cod liver oil, etc. Butyric acid is a colorless liquid, having a smell like that of rancid butter; its taste is acrid and biting, with a sweetish after taste.

BUTYRIC ESTER, a substance obtained from butyric acid with the flavor of pineapples, used in flavoring confectionery, as an ingredient in perfumes, etc.

BUXTON, a town in Derbyshire, England, 37 miles N. W. of Derby, and 25 S. S. E. of Manchester. Buxton has long been famous for its calcareous springs, the waters being taken for indigestion, gout, rheumatism, and nervous and cutaneous diseases. Near Buxton is the Diamond Hill, famous for its crystals; and Poole's Hole, a stalactite cavern 770 yards long. Mary, Queen of Scots, was at Buxton when in the custody of the Earl of Shrewsbury. Pop. about 15,000.

BUXTON, SYDNEY CHARLES, VISCOUNT, a British statesman; born in 1853. He received his education at Cambridge. From 1876 to 1882 he was a member of the London School Board, and of the Royal Commission on Education from 1886 to 1889. In 1892 he became Under-Secretary for the Colonies, which position he held for three years. He was member of Parliament from Peterborough in 1883. From 1905 to 1910, he was Postmaster-General, and made his administration notable by the introduction of penny postage to the United States. He was largely instrumental in passing the Insurance, Copyright, and Pilotage Acts (1911-1912). In 1914 he was made High Commissioner and Governor-General of South Africa. He has written a number of works on financial and economic subjects, among which are "Finance and Politics," "Handbook to Death Duties," and "The Fiscal Question."

BUXTON, SIR THOMAS FOWELL, an English philanthropist, born April 1, 1786; educated at Trinity College, Dublin. In 1811 he joined the firm of Truman, Hanbury & Co., brewers, and took an active share in the business. The Spitalfields distress, in 1816, was the occasion of his turning his attention to philanthropic efforts, and, along with his sister-in-law, the celebrated Mrs. Fry, he made inquiries which directed public attention to the system of prison discipline. In 1818 he was elected to Parliament for Weymouth, and was long the

able coadjutor of Wilberforce in his efforts for the abolition of slavery. He was created a baronet in 1840, and died Feb. 19, 1845.

BUZZARD, the English name of the *buteo*, a genus of birds, and especially of three species. These are:

1. The turkey buzzard (*cathartes aura*). This genus is more a carrion vulture than a raptorial bird, like some



BUZZARD

of the other genera described below. They are natives of our Southern States, where they are very useful as scavengers, and are so much appreciated in this regard that in most of the States they are protected by law. In consequence they grow quite tame, and in some places may be considered almost a domesticated fowl. They are about the size of a common turkey, and the species

gets its name from a distant resemblance between the two. They are of a dirty black color, and are from 25 to 36 inches long, having an immense span of wing (proportionate), being remarkable for their powerful and graceful flight. Its nest is a mere hollow in the ground with a rampart of loose, dead branches around it. These birds may be seen by hundreds in one locality, hovering over and lighting upon the carcass of a dead animal. They are rarely found N. of Pennsylvania.

2. The brown buzzard (*buteo vulgaris*), called also the glead, glede, glade, kite or puttock. The male is deep brown above, the margins of the feathers paler, the under parts yellowish white with brown spots, the face with brown and pale bands. The female is deep brown above and below, with whitish streaks on the throat, and spots of the same color on the breast. It feeds on small mammalia, birds, lizards, worms and insects. It makes its nest in trees and ledges of rock.

3. The rough legged buzzard (*buteo lagopus*), which is feathered to the toes.

BUZZARD'S BAY, a bay indenting the S. E. coast of Massachusetts; partly formed by the Elizabeth Islands. Its shores afford many summer resorts. Upon the bay New Bedford is situated.

BY-LAW, a private law; the local or subordinate law of a city, town, private corporation or other organization. The power to make by-laws is usually conferred by express terms of the charter creating the corporation; though, when not expressly granted, it is given by implication, and it is incidental to the very existence of a corporation. The Constitution of the United States and Acts of Congress made in conformity to it, the Constitution of the State in which a corporation is located, and all acts of the Legislature constitutionally made, together with the common law as there accepted, are of superior force to any by-law; and such by-law, when contrary to either of them, is void, whether the charter authorizes the making of such by-law, or not; because no legislature can grant power larger than it possesses.

BYNG, GEORGE, VISCOUNT TORRINGTON, an English admiral, born at Wrotham, Kent, in 1663, and entered the navy at the age of 15. In 1688 he recommended himself to William of Orange, and for his gallant conduct at the sea-fight of Malaga was knighted by Queen Anne. In 1718 he commanded the English fleet sent to Sicily for the protection of the neutrality of Italy, and on July 31st utterly destroyed the Span-

ish fleet off Messina. In 1721 he was created Viscount Torrington. He died Jan. 17, 1733.

BYNG, JOHN, a British admiral, born in 1704, entered the navy in 1727, and served under his father, Admiral George Byng. He was sent to relieve Minorca, blockaded by a French fleet, but failed, it was thought, through hesitation in engaging the enemy. The public odium of the failure was such that the ministry allowed Byng, who was condemned by a court-martial, to be shot, at Portsmouth, March 14, 1757.

BYNG, SIR JULIAN HEDWORTH GEORGE, a British soldier; born in 1862. He chose a military career and joined the 10th Royal Hussars in 1883, rising through the various grades until he became colonel in 1901. He served with distinction in the Sudan Expedition and



GENERAL SIR JULIAN BYNG

the Boer War. It was in the World War, however, that he gained fame as an army commander on the western front, especially at Cambrai, where he broke the German lines by a surprise attack, and later as leader of the vanguard in driving the enemy from France in the summer and fall of 1918.

BYRD, or BIRDE, WILLIAM, an English composer, born in Lincoln in 1538, studied under Tallis; became organist of Lincoln in 1563; was appointed a gentleman of Queen Elizabeth's Chapel Royal in 1569. The composer of the first English madrigals (1588), he wrote much sacred music, including the well-known canon, "Non Nobis, Domine!" as well as largely for the virginal. He died in London, July 4, 1623.

BYRON, GEORGE GORDON NOEL LORD, one of the greatest English poets, born in London, Jan. 22, 1788. He was the grandson of Admiral John Byron and son of the Admiral's only son, Capt. John Byron, of the Guards, known as "Mad Jack Byron." His mother was Catherine Gordon of Aberdeenshire, who was left a widow in 1791. Mrs. Byron retired with the infant poet to Aberdeen, where she lived in seclusion on the ruins of her fortune. Till the age of seven he was entirely under the care of his mother, and to her injudicious indulgence the waywardness that marked his after career has been partly attributed. On reaching his seventh year he was sent to the grammar school at Aberdeen, and four years after, in 1798, the death of his granduncle gave him the titles and estates of the family. Mother and son then removed to Newstead Abbey, the family seat, near Nottingham. Soon after Byron was sent to Harrow, where he distinguished himself by his love of manly sports and his undaunted spirit. While yet at school he fell deeply in love with Miss Chaworth, a distant cousin; but the lady slighted the homage of the Harrow school boy, her junior by two years, and married another and more mature suitor. In "The Dream," Byron alludes finely to their parting interview. In 1805 he was entered at Trinity College, Cambridge. Two years after, in 1807, appeared his first poetic volume, "Hours of Idleness," which, though indeed containing nothing much of merit, was castigated with over-severity by Brougham in the "Edinburgh Review." This caustic critic roused the slumbering energy in Byron, and drew from him his first really notable effort, the celebrated satire, "English Bards and Scotch Reviewers." In 1809, in company with a friend, he visited the southern provinces of Spain, and voyaged along the shores of the Mediterranean. The fruit of these travels was the fine poem of "Childe Harold's Pilgrimage," the first two cantos of which were published on his return in 1812. The poem was an immense success, and Byron "awoke one morning and found himself famous." His acquaintance was

now much courted, and his first entry on the stage of public life may be dated from this era. During the next two years (1813-1814) the "Giaour," the "Bride of Abydos," the "Corsair," "Lara," and the "Siege of Corinth" showed the brilliant work of which the new poet was capable. On Jan. 2, 1815, Byron married Anna Isabella, only daughter of Sir Ralph Milbanke, but the marriage turned out unfortunate, and in about a year, Lady Byron, having gone on a visit to her parents, refused to return, and a formal separation took place. This rupture produced a considerable sensation, and the real cause of it has never been satisfactorily explained. It gave rise to much popular indignation against Byron, who left England, with an expressed resolution never to return. He visited France, the



LORD BYRON

field of Waterloo, and Brussels, the Rhine, Switzerland, and the north of Italy, and for some time took up his abode at Venice, and later at Rome, where he completed his third canto of "Childe Harold." Not long after appeared the "Prisoner of Chillon," "The Dream," and other "Poems," and, in 1817, "Manfred," a tragedy, and the "Lament of Tasso." From Italy he made occasional excursions to the islands of Greece, and at length visited Athens, where he sketched many of the scenes of the fourth and last canto of "Childe Harold." In 1819 was published the romantic tale of "Mazeppa," and the same year was marked by the com-

mencement of "Don Juan." In 1820 appeared "Marino Faliero, Doge of Venice," a tragedy; the drama of "Sardanapalus," the "Two Foscari," a tragedy, and "Cain," a mystery. After leaving Venice, Byron resided for some time at Ravenna, then at Pisa, and lastly at Genoa. At Ravenna he became intimate with the Countess Guiccioli, a married lady; and when he removed to Pisa, in 1822, she followed him. There he continued to occupy himself with literature and poetry, sustained for a time by the companionship of Shelley, one of the few men whom he entirely respected and with whom he was quite confidential. Besides his contributions to the "Liberal," a periodical established at this time in conjunction with Leigh Hunt and Shelley, he completed the later cantos of "Don Juan," with "Werner," a tragedy, and the "Deformed Transformed," a fragment. These are the last of Byron's poetical efforts. In 1823, troubled perhaps by the consciousness that his life had too long been unworthy of him, he conceived the idea of throwing himself into the struggle for the independence of Greece. In January, 1824, he arrived at Missolonghi, was received with the greatest enthusiasm, and immediately took into his pay a body of 500 Suliotes. The disorderly temper of these troops, and the difficulties of his situation, together with the malarious air of Missolonghi, began to affect his health. On April 9, 1824, while riding out in the rain, he caught a fever, which, 10 days later, ended fatally. Thus, in his 37th year, died prematurely a man whose natural force and genius were perhaps superior to those of any Englishman of his time, and, largely undisciplined as they were, and wasted by an irregular life, they acquired for him a name second, in the opinion of Continental Europe, at least, to that of no other Englishman of his time. The body of Byron was taken to England and interred near Newstead Abbey.

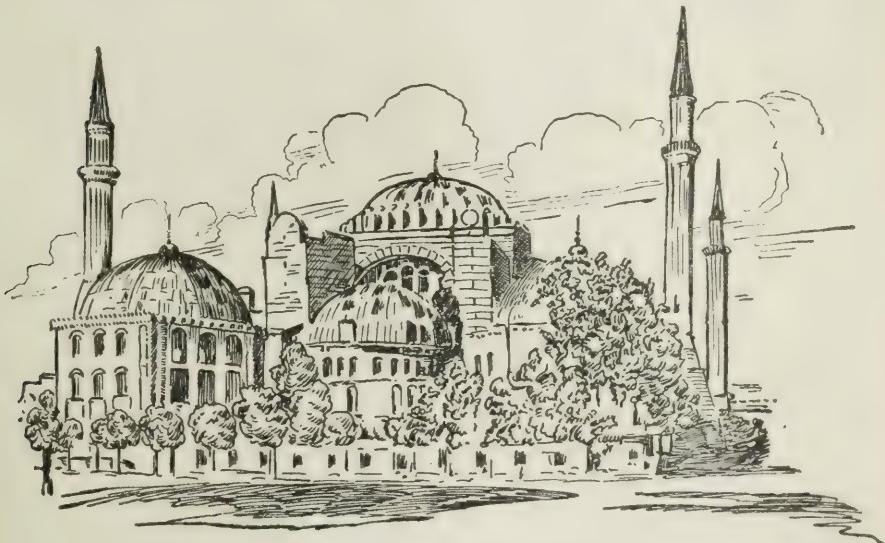
BYZANTINE EMPIRE, the Eastern Roman Empire, so called from its capital, Byzantium or Constantinople. The Byzantine Empire was founded in A. D. 395, when Theodosius at his death divided the Roman Empire between his sons Arcadius and Honorius. In this Empire the Greek language and civilization were prevalent; but the rulers claimed still to be Roman Emperors, and under their sway the laws and official forms of Rome were maintained. It lasted for about 1,000 years after the downfall of the Western Empire. It is also known as the Greek Empire or Lower Empire. Its capital was natu-

rally Constantinople, a city established by Constantine in 330 as the new capital of the whole Roman Empire.

The Eastern Empire, then comprising Asia Minor, Syria, Egypt, Greece, Thrace, Moesia, Macedonia, and Crete, fell to Theodosius' elder son Arcadius, through whose weakness and that of several of his immediate successors it suffered severely from the encroachments of Huns, Goths, Bulgarians, and Persians. In 527 the celebrated Justinian succeeded, whose reign is famous for the codification of Roman law, and the victories of his generals, Belisarius and Narses, over the Vandals in Africa, and the Goths in Italy, which was henceforth governed for the Eastern Empire by an exarch residing at Ravenna. But his energy could not revive the decaying strength of the Empire, and Justin II., his successor (565-578), a weak and avaricious prince, lost his reason by the

indeed he overthrew. But a far more dangerous enemy to the Byzantine Empire now appeared in the Moslem power, founded among the Arabians by Mohammed and the caliphs, which gradually extended its conquests over Phoenicia, the countries on the Euphrates, Judea, Syria, and Egypt (635-641). In 641 Heraclius died, nor was there among his descendants a single prince capable of stemming the tide of Moslem invasion. The Arabians took part of Africa, Cyprus and Rhodes (653), inundated Africa and Sicily, penetrated into Thrace, and attacked Constantinople by sea.

The Empire was in sore straits when Leo the Isaurian (Leo III.) general of the Army of the East, mounted the throne (716), and a new period of comparative prosperity began. Some writers date the beginning of the Byzantine Empire proper, and the end of the Eastern Roman Empire, from this era.



ST. SOPHIA, CONSTANTINOPLE

reverses encountered in his conflicts with plundering Lombards, Avars, and Persians. Tiberius, a captain of the guard, succeeded in 578, and, in 582, Mauricius; both were men of ability. In 602 Phocas, proclaimed Emperor by the army, succeeded, and produced by his incapacity the greatest disorder in the Empire. Heraclius, son of the governor of Africa, who headed a conspiracy, conquered Constantinople, and caused Phocas to be executed (610). He was an excellent general, and finally succeeded in repressing the Avars and recovering the provinces lost to the Persians, whose power

Numerous reforms, civil and military, were now introduced, and the worship of images was prohibited. Leo repelled the Arabians or Saracens from Constantinople, but allowed the Lombards to seize the Italian provinces, while the Arabians plundered the Eastern ones. Constantine V. (741) recovered part of Syria and Armenia from the Arabians; and the struggle was carried on, not unsuccessfully, by his son, Leo IV. Under his grandson, Constantine VI., Irene, the ambitious mother of the latter, raised a large faction by the restoration of image worship, and, in conjunction with

her paramour, Stauratius, deposed her son, and had his eyes put out (797). A revolt of the patricians placed one of their order, Nicephorus, on the throne, who fell in the war against the Bulgarians (811). Stauratius, Michael, Leo V., and Michael II. (820) ascended the throne in rapid succession. During the reign of the latter the Arabians conquered Sicily, lower Italy, Crete, and other countries. The long dispute as to image worship was brought to a close in 842, when the practice was finally sanctioned at the council of Nicæa, under Michael III. He was put to death by Basil the Macedonian, who came to the throne as Basil I., in 867, and whose reign formed a period of great glory in the history of the Byzantine Empire. He founded a dynasty (the Macedonian) which lasted till 1056. Among the greatest of his successors were Nicephorus II. (Phocas), and John Zimisces (969), who carried on successful wars against the Mohammedans, Bulgarians, and Russians. Basil II. succeeded this Prince in 976. He vanquished the Bulgarians and the Arabians. His brother, Constantine VIII. (1025), was succeeded by Romanus III. (1028), who married Zoe, daughter of Constantine. This dissolute but able princess caused her husband to be executed, and successively raised to the throne Michael IV. (1034), Michael V. (1041), and Constantine X. (1042). Russians and Mohammedans meanwhile devastated the Empire. Her sister, Theodora, succeeded her on the throne (1054).

After the short reign of Michael VI. (1054-1057) Isaac Comnenus, the first of the Comnenian dynasty, ascended the throne, but soon after became a monk. The three chief emperors of this dynasty were Alexius, John, and Manuel Comnenus. During the reign of Alexius I. (1081-1118) the Crusades commenced. His son, John II., and grandson, Manuel I., fought with success against the Turks, whose progress also was considerably checked by the Crusades. The Latins, the name given to the French, Venetian, etc., crusaders, now forced their way to Constantinople (1204), conquered the city, and retained it, together with most of the European territories of the Empire. Baldwin, Count of Flanders, was made Emperor; Boniface, Marquis of Montferrat, obtained Thessalonica as a kingdom, and the Venetians acquired a large extent of territory. Theodore Lascaris seized on the Asiatic provinces, in 1206 made Nice (Nicæa) the capital of the Empire, and was at first more powerful than Baldwin. Neither Baldwin nor his suc-

sors, Henry, Peter, and Robert of Courtenay, were able to secure the tottering throne. John, Emperor of Nice, conquered all the remaining Byzantine territory except Constantinople, and at last, in 1261, Michael Palæologus, King of Nice, conquered Constantinople, and thus overthrew the Latin dynasty.

Thus again the vast but exhausted Byzantine Empire was united under Michael Palæologus, founder of the last Byzantine dynasty. Internal disturbances and wars with the Turks disturbed the reigns of his descendants, Andronicus II. and Andronicus III. For a time the Cantacuzenes shared the crown with John Palæologus, son of Andronicus III.; but in 1355 John again became sole Emperor. In his reign the Turks first obtained a firm footing in Europe, and conquered Gallipoli (1357). In 1361 Sultan Amurath took Adrianople. Bajazet conquered almost all the European provinces except Constantinople, and was pressing it hard when Timur's invasion of the Turkish provinces saved Constantinople for this time (1402). Manuel then recovered his throne, and regained some of the lost provinces from the contending sons of Bajazet. To him succeeded his son John, Palæologus II. (1425), whom Amurath II. stripped of all territories except Constantinople, and laid under tribute (1444). To the Emperor John succeeded his brother Constantine Palæologus. With the assistance of his general Giustiniani, a Genoese, he withstood the superior forces of the enemy with fruitless courage, and fell in the defense of Constantinople, by the conquest of which (May 29, 1453) Mohammed II. put an end to the Greek or Byzantine Empire. The Byzantine Empire, which thus lasted for over 1,000 years, was of immense service to the world in stemming the tide of Mohammedan advance, in spreading Christianity and civilization, and in maintaining a regular system of government, law, and policy in the midst of surrounding barbarism.

BYZANTIUM, a city on the Thracian Bosporus, founded by emigrants from Megara in 667 B. C. It rose rapidly to importance as a seat of commerce, was subject to the Persians (515-478 B. C.), was freed by Pausanias, and was alternately Athenian and Lacedæmonian during the Peloponnesian War. Thrasybulus expelled the Spartans in 390, and the city long enjoyed a kind of independence. It was taken by Severus in 196 A. D., and in 330, under the name of New Rome or Constantinople, it was made the metropolis of the Roman Empire.

C

C, in Anglo-Saxon, was taken directly from the Latin alphabet, the source, it is believed, whence it has passed into various languages. In English words immediately derived from Anglo-Saxon, the *c* of the Anglo-Saxon often becomes *k* in English, as A. S. *cyn*=Eng. *king*; A. S. *cyn*=Eng. *kin*, or *kindred*. Sometimes the A. S. *c* becomes *q* in English, as A. S. *Cwen*=Eng. *queen*. At others it is changed into *ch*, as A. S. *cild*=Eng. *child*. In modern English *c* has two leading values. Before *i* and *e* it is sounded as *s* (examples: *certain*, *cincture*), and before *a*, *o*, and *u* as *k* (examples: *cat*, *cost*, *curtly*). It is mute before *k*, as *trick*.

C. As an initial is used:

1. In chronology: Chiefly for Christ, as B. C.=(Before Christ).

2. In Music: For counter-tenor, or contralto.

3. In university degrees: For Civil, as D. C. L.=Doctor of Civil Law.

C. As a symbol is used:

1. In numerals: For 100. Thus CII=102, CC=200.

2. In chemistry: For the element carbon, of which it is also the initial letter.

3. In music:

(1) For the first note of the diatonic scale, corresponding to *do* of the Italians.

(2) For the natural major mode, that in which no sharps or flats are employed.

(3) For common or four-crochet time.

CAABA, or **KAABA**, the Mohammedan temple at Mecca, especially a small oratory within, adored by Mohammedans as containing the black stone said to have been given by an angel to Abraham on the occasion of building the original Caaba.

CABAL, a *junto*, a small number of persons in secret conclave carrying out their purposes in church and state by intrigue and trickery. This bad sense was acquired in the time of Charles II. of England.

CABANEL, ALEXANDRE, a French historical painter, born in Montpellier, Sept. 28, 1823. His subjects are drawn from the Bible or from poetry and legend, and are almost without exception of a morbid and sensuous character. Thus from the Bible he takes the repulsive story of "Tamar," and also paints the "Sulamite Listening to the Voice of Her Lover." This latter picture is in the Wolfe collection, Metropolitan Museum of New York. Cabanel also painted many portraits. He died in Paris, Jan. 23, 1889.

CABARET, a vaudeville entertainment, usually given in a restaurant during meals. The entertainment is called cabaret shows. These shows have become very popular in the larger cities during recent years.

CABBAGE (*Brassica oleracea*), a plant in general cultivation for culinary purposes, and for feeding cattle. The common cabbage is said to have been introduced into England by the Romans, but to have been little known in Scotland until brought by Cromwell's soldiers. The principal varieties are known to have existed at least as far back as the 16th century, but minor varieties are being constantly produced by selection and intercrossing. The varieties differ greatly from each other, and the ancestral wild cabbages yet admit of simple interpretation as terms of a continuous series of simple variations. The parent is of highly vegetative character, as its habitat and habit alike show; and placed in more favorable conditions its growth becomes luxuriant. More normally, it is carried back into the stem, and this may accordingly become swollen and turnip-like, in which case we have the kohlrabi. The vegetative overplus may, however, also be applied to the formation of buds, which accordingly develop with peculiar exuberance, giving us Brussels sprouts. The most evolved and final variety is the cauliflower, in which the

vegetative surplus becomes poured into the flowering head, of which the flowering is more or less checked; the inflorescence becoming a dense corymb instead of an open panicle, and the majority of the flowers aborting, so as to become incapable of producing seed. Let a specially vegetative cabbage repeat the excessive development of its leaf parenchyma, and we have the wrinkled and blistered savoy, of which the hardy constitution, but comparative coarseness, becomes also more intelligible. Again a specially vegetative cauliflower gives us an easily grown and hardy winter variety, Broccoli, from which, and not from the ordinary cauliflower, a sprouting variety arises in turn.

The cabbage is biennial, consequently the main crop must be sown the autumn previous to that in which it is to be reaped. Field cabbages and the drum-head varieties that are used in gardens, being late in character, may be sown in July, or from the third week of that month to the second week of August. But the smaller and early sorts used in gardens should not be sown before the first week of August, nor later than the second week of that month. If the plants are reared earlier, they are apt to run to seed the following spring; and if, on the other hand, they are reared later, they will not acquire strength enough to withstand the cold of winter before it comes upon them. For successive crops to be used in the shape of young summer cabbages, one or two sowings may be made from the beginning of March to the beginning of April. Autumn-sown plants may be planted out in rows permanently as soon as they are strong enough. Additional plantations from the same sowing may be made in spring, to be followed by others, made at intervals, up till July, from spring-sown plants. Thus a close succession of usable cabbage may be obtained the year round. In the northern parts of the United States, cabbages for the early summer market are sown about September, kept under glass or frames during winter, and planted out in spring. For later markets, the seed is sown in beds as early as possible in spring (about March), and transplanted later. Cabbages are sometimes preserved for winter by inverting them and burying them in the ground. Cabbage coleworts may be obtained from any good early variety of cabbage. They are simply cabbages which are not permitted to form hearts, but are used while the leaves are yet green and the hearts more or less open. Three sowings should be made for the rearing of these: the first about the

middle of June, the second about the same time in July, and the third about the last week of the latter month, or the first week of August. These sowings will provide crops of green cabbages from October till March or April, if the winter is not destructive, after which they begin to run to seed.

CABBAGE BUTTERFLY, a name given to several species of butterfly, especially *Pontia*, or *Pieris brassicæ*, a large white butterfly, the larvæ of which destroy cruciferous plants, particularly of the cabbage tribe.

CABBAGE MOTH (*Mamestra brassicæ*), a species of moth, the caterpillar of which feeds on cabbage and turnip leaves, and is sometimes very destructive. The caterpillar is greenish-black, and changes to a chestnut chrysalis in autumn. The perfect insect is predominantly of a rich mottled-brown color, with beautiful markings. The winter chrysalids should be destroyed when turned up in digging; the voracious grubs should be picked away from the cabbages, and the stems may be very profitably protected by making a ring in the ground with spirit of tar, quicklime, or, best of all, gas-lime.

CABBAGE ROSE, a species of rose (*Rosa centifolia*) of many varieties, supposed to have been cultivated from ancient times, and eminently fitted for the manufacture of rose water and attar from its fragrance. It has a large, rounded, and compact flower. Called also Provence rose.

CABBALA, or KABBALAH, a system of Jewish theosophy, bearing a certain similarity to Neo-Platonism. Its founders are considered by Dr. Ginsburg to have been Isaac the Blind and his disciples Ezra and Azariel of Zerona, who flourished between A. D. 1200 and 1230. It was designed to oppose the philosophical system of Maimonides. The cabbala represented God, called *Ain Soph*, meaning without end or boundless, as being utterly inconceivable. He has become known, however, by means of ten intelligences, named Crown, Wisdom, Intelligence, Love, Justice, etc., whom he has brought into being, and by whom he created and now governs the world.

CABELL, JAMES BRANCH, an American writer, born in Richmond, Va., in 1879. He graduated from William and Mary College in 1898 and for a time worked on the staffs of several newspapers. He was a frequent contributor of short stories to magazines and also wrote verses, essays, and papers on historical and biographical subjects. His

novels include "The Eagle's Shadow" (1904); "The Soul of Melicent" (1913); and "Jürgen" (1919). From 1916 he was historian of the Virginia Society of Colonial Wars, and from 1919 was editor of the Virginia War History Commission.

CABELL, JAMES LAWRENCE, an American sanitarian, born in Nelson County, Va., Aug. 26, 1813. He was graduated at the University of Pennsylvania, later becoming Professor of Anatomy in Virginia. During the Civil War he had charge of military hospitals for the Confederate Government. He devised measures to check the yellow fever epidemic at Memphis and was president of the National Board of Health from 1879 till his death, in Overton, Va., Aug. 13, 1889.

CABET, ÉTIENNE (kä-bä'), a French communist, born in Dijon, Jan. 2, 1788, and educated for the bar, but turned his attention to literature and politics. Under the Restoration he was one of the leaders of the Carbonari, and in 1831 was elected deputy for the department of Côte d'Or. Soon afterward he published a "History of the July Revolution" (1832), started a Radical Sunday paper, "Le Populaire" (1833), and on account of an article in this paper was sentenced to two years' imprisonment, but escaped to London. After the amnesty, in 1839, he returned to Paris, and published a "History of the French Revolution" (1840), bestowing great praise on the old Jacobins. He attracted far more notice by his "Journey in Icaria" (1840), a "philosophical and social romance," describing a communistic Utopia. The work obtained great popularity among the working classes of Paris. Cabet next proceeded to send an "Icarian colony" to the Red river in Texas, but the colonists who went out in 1848 found Texas anything but a Utopia. Their ill fortune did not deter Cabet from embarking at the head of a second band of colonists. On his arrival he learned that the Mormons had just been expelled from Nauvoo, Ill., and that their city was left deserted. The Icarians established themselves there in 1850. Cabet's efforts, however, were not successful. He was finally obliged to leave Nauvoo and retire to St. Louis, where he died Nov. 9, 1856.

CABINDA, a Portuguese seaport and territory, N. of the mouth of the Kongo river. The town carries on a considerable trade, and its people are noted for their shipbuilding and other handicrafts. Pop. about 10,000.

CABINET, a deliberative committee of the executive authority, consisting of

the principal members of the Government. The cabinet of the President of the United States may be said to be composed of the heads of the several administrative departments of the Government, although the Constitution does not provide for a "cabinet." They are, in the order of succession to the Presidency as declared by Acts of Congress: 1. The Secretary of State. 2. The Secretary of the Treasury. 3. The Secretary of War. 4. The Attorney-General. 5. The Postmaster-General. 6. The Secretary of the Navy. 7. The Secretary of the Interior. 8. The Secretary of Agriculture. 9. The Secretary of Commerce. 10. The Secretary of Labor. They are appointed to office by the President, but their appointments must be confirmed by the Senate, and they generally hold office until their successors are appointed and confirmed. Contrary to foreign systems, the United States cabinet ministers do not have seats in Congress; and the President is responsible for the acts of the Government.

In Great Britain, the cabinet is the body of ministers who carry on the government. It is an institution which has gradually grown out of the needs and exigencies of English political life, and is now an essential part of English polity. As the executive organ of Parliament, it is very elastic, and while subject to considerations of use and wont, its action can be suited to the exigencies of time and circumstance. The cabinet includes: The First Lord of the Treasury, the Lord Chancellor, the Lord President of the Council, the Lord Privy Seal, the five secretaries of state (for Home Affairs, Foreign Affairs, Colonies, India, and War), the Chancellor of the Exchequer, the First Lord of the Admiralty, the Lord Lieutenant or the Chief Secretary of Ireland, the Presidents of the Board of Trade, the Board of Agriculture and Fisheries, the Board of Education, the Ministers of Health, Labor, and Transport. Other ministers, like the Postmaster-, Attorney-, Solicitor-, and Paymaster-General are not members of the cabinet.

CABLE is either a large rope or a chain of iron links. Rope cables are made of the best hemp or of wire, twisted into a mass of great compactness and strength. The circumference of hemp rope varies from about 3 inches to 26. Wire rope has largely taken the place of hemp for tow-line and hawsers on board ship. These usually consist of six strands, laid or spun around a hempen core, each strand consisting of six wires laid the contrary way around a smaller hempen core. The wires are

galvanized or coated with a preservative composition. Wire ropes are usually housed on board ship by winding them round a special reel or drum. Hemp cables, moreover, have for long been almost wholly superseded by chain cables; the introduction of steam on board ship having brought in its train the powerful steam windlass wherewith to manipulate the heaviest chains and anchors required. Hempen and wire ropes are invariably used as tow-lines and for mooring vessels.

Chain cables are made in links. There are two distinct kinds of chain cables—the stud-link chain, which has a tie or stud welded from side to side, and the short-link or unstudded chain. The sizes of chain cables are denoted by the thickness of rod iron selected for the links.

In mechanical engineering, a cable is the wire rope used for the purpose of moving the kind of street cars commonly called cable cars or grip cars. A very serious phase of the cable system is in the fact that by far the greater per cent. of the initial power is required to simply haul the cable without cars attached, or when the cable is a little worn it is easily overloaded. The wire rope used for submarine telegraphy is also called a cable. The term is also applied to wires used underground in telephone and electric lighting work, as well as to certain aerial wires used for power transmission. See TELEPHONE; TELEGRAPH. In navigation the cable is a nautical measure of distance—120 fathoms, or 720 feet, by which the distances of ships in a fleet are frequently estimated.

CABLE, GEORGE WASHINGTON, an American novelist; born in New Orleans, La., Oct. 12, 1844. After the Civil War he began to contribute sketches to newspapers, and afterward published stories in magazines. Among his published books are: "Old Creole Days," "The Grandissimes," "Madame Delphine," "Dr. Sevier," "The Creoles of Louisiana," "The Silent South," "John March, Southerner," "Bonaventure," "Strange, True Stories of Louisiana," "The Busy Man's Bible," "The Negro Question," "Strong Hearts," "Gideon's Band," "Lovers of Louisiana," etc.

CABOT, GEORGE, an American statesman; born in Salem, Mass., Dec. 3, 1751; educated at Harvard College. In 1791 he became United States Senator for Massachusetts, a post which he held for five years—a steadfast friend throughout of the Washington administration. He yielded essential aid to Hamilton in perfecting his financial system. In 1814

he was chosen a delegate to the memorable Hartford Convention, and was elected president of that assembly. He died in Boston, April 18, 1823.

CABOT, JOHN (IT. GIOVANNI CABOTO), a Venetian pilot, the discoverer of the mainland of North America, settled as a merchant, probably as early as 1472, in Bristol, England, where he is supposed to have died about 1498. Under letters-patent from Henry VII., dated March 5, 1496, he set sail from Bristol in 1497, with two ships, accompanied by Lewis, Sebastian, and Sancto, his sons, and on June 24th sighted Cape Breton Island and Nova Scotia. Letters-patent were granted Feb. 3, 1498, for a second expedition, but whether any voyages were made under these is doubtful. However, they form the last authentic record of his career.

The same uncertainty exists as to the birthplace of his second son, **SEBASTIAN**, who, it now appears most probable, was born in Bristol in 1474. Sebastian's name is associated with that of his father in the charter of 1496, and in 1499 he appears to have sailed with two ships in search of a Northwest Passage, and followed the American coast from 60° to 30° N. lat.; but it has been considered doubtful whether this voyage also should not be assigned to his father. We hear no more of Sebastian till 1512, when he appears to have attained some fame in England as a cartographer, in which capacity he entered the service of Ferdinand V. of Spain in the same year. A contemplated voyage of discovery to the Northwest was frustrated by the death of the King in 1516; and the jealousy of the Regent, Cardinal Ximenes, impelled Cabot to return to England in 1517. During this visit he appears to have been offered by Henry VIII., through Wolsey, the command of an expedition which, through either the cowardice or malice of Sir Thomas Perte, who was appointed his lieutenant, "tooke none effect"; but whether the expedition ever left England or not has been disputed. In 1519 Cabot returned to Spain, and was appointed pilot-major of the kingdom by Charles V., who, in 1526, placed him in command of an expedition which examined the coast of Brazil and La Plata, where he endeavored to plant colonies. The attempt ending in failure, he was imprisoned for a year in 1530, and banished for two years to Oran, in Africa. In 1533 he obtained his former post in Spain, but in 1547 he once more betook himself to England, where he was well received by Edward VI., who made him inspector of the navy, and gave him a pension. To this monarch he seems

to have explained the variation of the magnetic needle in several places, which he was among the first, if not the very first, to notice particularly. In 1553 he was the prime mover and director of the expedition of Merchant Adventurers which opened to England an important commerce with Russia. Of his famous map (1544), embodying the discoveries of his father and himself, one example exists, preserved in the Bibliothèque Nationale at Paris. He seems to have died in London in 1557.

CABRERA (kä-brä'rä), a small Spanish island, one of the Balearic Isles. The chief industry of the inhabitants, consisting only of a few hundred, is fishing.

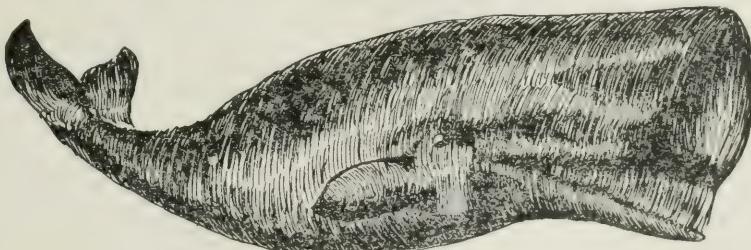
CACAO, or **COCOA**, the chocolate tree (*Theobroma Cacao*), natural order *Butteriaceæ*, and also the powder and beverage made with it obtained from the fruit of this tree. The tree is 16 to 18 feet high, a native of tropical America, and much cultivated in the tropics of both hemispheres, especially in the West India Islands, Central and South America. Its fruit is contained in pointed, oval, ribbed pods 6 to 10 inches long, each inclosing 50 to 100 seeds in a white, sweetish pulp. These are very nutritive, containing 50 per cent. of fat, are of an agreeable flavor, and used, both in their fresh state and when dried, as an article of diet. Cocoa and choco-

different tree. In 1917 the world's cacao production was estimated at over 730,000,000 pounds. The chief cacao-producing countries, in their relative order, were: British colonies, Brazil, Ecuador, San Domingo, and Venezuela.

CACAPON, or **GREAT CACAPON**, a river in West Virginia. It flows nearly N. W. through Hampshire and Morgan counties, and enters the Potomac about 5 miles from Berkeley Springs. Its length is about 140 miles.

CÁCERES (kä'thā-rä's), the second largest province of Spain, in the N. of Extremadura, owned chiefly by large proprietors, and mostly devoted to cattle-raising; the N. half is a good wine country. The area is 7,667 square miles, and the population about 425,000. The capital, Cáceres, 45 miles N. of Merida by rail, is famous for its bacon and sausages, and has a bull-ring of granite, dye-works, and manufactures of woolens, crockery, and rope. It was the *Castra Cæcilia* of the Romans, by whom it was founded in 74 B. C.; and here the allied forces defeated the rear-guard of the Duke of Berwick, April 7, 1706. Pop. about 17,500.

CACHALOT, a cetacean of the family *Balaenidæ*. It is the *Physeter macrocephalus*, called also the sperm or spermaceti whale. The male is from 46 to 60, or even 70 feet long; the female from 30 to 35. It is black, becoming whitish



CACHALOT

late are made from them, the former being a powder obtained by grinding the seeds, and often mixed with other substances when prepared for sale, the latter being this powder mixed with sugar and various flavoring matters and formed into solid cakes. The seeds when roasted and divested of their husks and crushed are known as cocoa nibs. The seeds yield also an oil called butter of cacao, used in pomatum and for making candles, soap, etc. The term cocoa is a corruption of cacao, but is more commonly used in commerce; cocoa nuts, however, are obtained from an entirely

below. The cachalots feed chiefly on squids or cuttle-fishes. They are gregarious, and go in schools, sometimes with as many as 500 or 600 individuals. There are two kinds—female schools and schools of males not fully grown. With each female school are from one to three large bulls, or, as the whalers call them, schoolmasters. The cachalot inhabits the northern seas, but straggles through a great part of the ocean.

CACHAO, or **HANOI**, the largest city in the French Protectorate of Tonquin, on the Tonquin river, about 150 miles

from its mouth. The river is navigable to this point for small vessels. The principal trade is silk and rice. Bullock, silk, and lacquered work are the exports. It is an open port since 1873, when it passed into the hands of the French. In 1902 it became the capital of French Indo-China. It is the seat of the University of Indo-China, courts, etc. Pop. about 150,000.

CACHE, a hole in the ground for hiding and preserving provisions which it is inconvenient to carry.

CACHE, the name of (1) a peak of the Rocky Mountains in Idaho, height 10,451 feet; (2) a fertile valley in the Wahsatch Mountains in Utah and Idaho. It is 60 miles long and 10 to 20 miles wide, and has an altitude of 5,000 feet. It is watered by the Bear river and has several villages, of which Logan is the largest; (3) a river in Arkansas, flowing N. W. about 150 miles into the White river near Clarendon, in Monroe county.

CACHET, LETTRE DE (kä-shä'), a name given especially to letters proceeding from and signed by the kings of France, and countersigned by a secretary of state. They were at first made use of occasionally as a means of delaying the course of justice, but they appear to have been rarely employed before the 17th century as warrant for the detention of private citizens, and for depriving them of their personal liberty. During the reign of Louis XIV. their use became frightfully common, and by means of them persons were imprisoned for life or for a long period on the most frivolous pretexts. They were abolished at the Revolution.

CACTUS, an old and extensive genus of Linnaeus, in four sections: (1) The echinomelocacts; (2 and 3) cerei of two kinds; and (4) opuntiae. It is now broken up into a number of genera. It is still popularly used as the designation of nearly the whole of the Cactaceæ, to which order, moreover, it has given its name. Cacti are sometimes called melon thistles.

Hedgehog cactus; a designation of the genus *Echinocactus*.

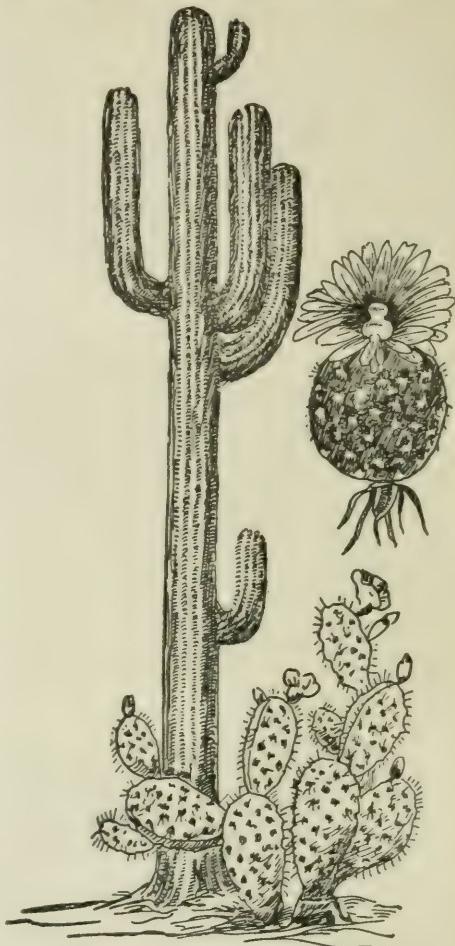
Leaf cactus; the *Epiphyllum*.

Melon thistle cactus; the *Melocactus*.

Nipple cactus; the *Mammillaria*.

The Hindus compare Europeans in the East to the species of cactus (*opuntia dillenii*), which they know best. The plant, though now seen all over India, undoubtedly came at first from a foreign and a distant country. It grows very extensively in the western and

southwestern part of the United States and all over tropical America, usually on arid lands. Once rooted in a place, it spreads so widely abroad that it is



CACTI

difficult to get it out again, and it is believed to impoverish the land of which it takes possession. It is of so abnormal a type that none but itself can be its parallel. An unpleasant feature about it is that, from whatever side you approach it, you are met in all directions by fixed bayonets.

CADE, JACK, the leader of a popular insurrection in the reign of Henry VI. of England. He was a native of Ireland, but, claiming kindred with the royal house of York, and assuming the name of John Mortimer, he collected 20,000 followers, chiefly Kentish men, who, in June, 1450, flocked to his stand-

ard, that they might claim redress for the grievances so widely felt. Cade defeated a detachment of the royal forces at Seven Oaks, and obtained possession of London, the King having retired to Kenilworth; but having put Lord Say cruelly to death, and laid aside the appearance of moderation which he had at first assumed, the citizens rose, gave his followers battle, dispersed them, and put Cade to death, 1450.

CADENABBIA, a health resort, beautifully situated among orange and citron groves, on the W. shore of Lake Como, Italy. Its famous Villa Carlotta contains works by the sculptors Canova and Thorwaldsen.

CADENCE. See HARMONY.

CADET, a younger or youngest son; a junior male member of a noble family. Also the name or title given to a young man in training for the rank of an officer in the army or navy, or in a military school. In Great Britain cadets are trained for the army by a course of military discipline, at the Royal Military Academy at Woolwich, or the Royal Military College at Sandhurst, previous to obtaining a commission. A naval cadet is one who holds the first or lowest grade as a candidate for a commission in the navy. In the United States cadets are trained for military life at West Point, N. Y., and for naval life at Annapolis, Md.

CADI, or KADI, in Arabic, a judge or jurist. Among the Turks cadi signifies an inferior judge, in distinction from the mullah, or superior judge. They belong to the higher priesthood, as the Turks derive their law from their prophet.

CADILLAC, a city of Michigan, the county-seat of Wexford co. It is on the Grand Rapids and Indiana, and the Ann Arbor railroads. The city is the center of an important lumbering region and has also manufactures of chemicals, furniture, and machinery. There is a hospital, a city hall, a court house, and a public library. Pop. (1910) 8,375; (1920) 9,750.

CADIZ, a city of Spain, capital of the province of the same name, which forms a part of Andalusia; is situated at the extremity of a narrow tongue of land projecting 5 miles N. W. from the isle of Leon, 95 miles S. S. W. of Seville by rail, 7 miles S. W. of Xeres. On the W. and S. the Atlantic Ocean washes the city, and on the N. and N. E. the Bay of Cadiz, a deep inlet of the Atlantic, forming an outer and an inner

bay. The city, which is walled and defended from the sea both by a series of forts and by low shelving rocks, is about 2 miles in circuit, and presents a remarkably bright appearance, with its shining granite ramparts, and its whitewashed houses crowned with terraces and overhanging turrets. Many of these flat roofs are also used as cisterns, the town being poorly supplied with water, which is brought from Santa Maria, 6 miles to the N. by sea, and 19 by rail. The streets are well paved and lighted, regular, but narrow, and there are some pleasant public walks, the most frequented of which is the Alameda, by the seaside. Cadiz has few public buildings of note; its two cathedrals are indifferent specimens of ecclesiastical architecture, but possess some excellent pictures by Murillo. It reached its highest prosperity after the discovery of America, when it became the depot of all the commerce with the New World; declined greatly as a commercial city after the emancipation of the Spanish colonies in South America; but again revived, owing partly to the extension of the Spanish railway system, and partly to the establishment of new lines of steamers.

Cadiz is one of the most ancient towns in Europe, having been built by the Phoenicians, under the name of Gaddir ("fortress"), about 1100 B. C. It afterward passed into the hands of the Carthaginians, from whom it was captured by the Romans, who named it Gades, and under them it soon became a city of vast wealth and importance. Occupied afterward by the Goths and Moors, it was taken by the Spaniards in 1262. In 1587 Drake destroyed the Spanish fleet in the bay; nine years later Cadiz was pillaged and burned by Essex; and in 1625 and 1702 it was unsuccessfully attacked by the English. From 1808 the headquarters of the Spanish patriots, Cadiz was blockaded by the French from February, 1810, until Aug. 25, 1812, when the victories of Wellington forced them to raise the siege. It was captured in 1823 for Ferdinand VII. by the French, who held it till 1828; and it was the birthplace of the Spanish revolution of 1868, as well as the scene in 1873 of an Intransigente rising. Pop. about 65,000.

CADMAN, (SAMUEL) PARKES, a Congregational clergyman; born in Wellington, England, Dec. 18, 1864. He was educated at Richmond College, London University. He came soon after to the United States, where he has since remained and has occupied prominent pulpits. From 1895 to 1900 he preached

at the Metropolitan Temple, New York, from which he went in the latter year to the Central Congregational Church, Brooklyn. He was a forceful speaker and lectured widely, besides taking a prominent part in community efforts looking toward social betterment. He wrote "Charles Darwin and Other English Thinkers" (1911), and "Three Great Oxford Movements" (1915).

CADMIUM, a diatomic metallic element, discovered in 1818; symbol, Cd; at. wt., 112; sp. gr. 8.6; melting point, 320°, boils at 778°. It is a white, ductile, malleable metal; scarcely tarnishes in the air; burns when heated in the air, forming a brown oxide, CdO. It dissolves readily in nitric acid, and decomposes water at red heat. Cadmium is found in some zinc ores; when these are distilled it rises in vapor before the zinc does so. It also occurs in the form of sulphide in greenockite. Cadmium is easily separated from zinc by passing HS₂ into their solution in HCl; the cadmium is precipitated as yellow sulphide, CdS. Cadmium can be separated from copper in analysis by dissolving their sulphides in nitric acid and adding ammonia in excess, filtering off oxides of other metals; then potassium cyanide is added till the precipitate first formed redissolves, then H₂S gas is passed through the liquid, from which it throws down the cadmium as sulphide.

CADMUS, according to ancient Greek tradition, the leader of a colony of Phoenicians, who settled at a very early date in Boeotia, and founded the city of Thebes, B. C. about 1450. The Greeks attributed to him the introduction into their country of the 16 simple alphabetical characters; and the close analogy in form between the Greek and Phoenician alphabets renders this account extremely probable. His personal history is almost entirely fabulous.

CADORNA, LUIGI, COUNT, an Italian General; born in Pallanza in 1850. He was educated at a military school and the national staff college. He rose through various grades until in 1898 he became a major-general. He was made lieutenant-general in 1905, and at the outbreak of the World War became chief of the general staff, succeeding Gen. Pollio. In May, 1915, when Italy had renounced the Triple Alliance and entered the field on the side of the Allies, Cadorna was made generalissimo of the Italian armies. The terrain upon which he had to fight the Austrians was the most difficult in Europe, with the possible exception of certain parts of the Balkans. Precipitous mountains

and rugged plateaus offered obstacles that were almost insuperable to military science. Yet Cadorna mastered these in the first two years of the war, and achieved notable successes in his offensive toward Gorizia (which he captured) and on the Carso Plateau. He was slowly but surely winning against



GENERAL CADORNA

the Austrians, until the defection of the Russians released the Austrian troops who were fighting on that front and enabled huge forces, co-operating with German shock troops, to be thrown against him. The great Austro-German drive was launched on Oct. 23, 1917, and resulted in an overwhelming disaster to the Italian arms. Thousands of cannon and hundreds of thousands of men were captured and the army was forced to retreat to the Tagliamento and afterward to the Piave, where at last they made a stand. The disaster resulted in the retirement of Cadorna from command and his replacement by Gen. Diaz.

CADWALADER, JOHN, an American soldier, born in Philadelphia, Jan. 10,

1742. At the outbreak of the Revolution he was placed in command of a battalion and soon became brigadier-general. He fought at Trenton, Brandywine, Germantown, and Monmouth. In 1777 he organized the militia of eastern Maryland. In 1778 he challenged and wounded Thomas Conway for plotting against Washington. His daughter became, in 1800, the wife of Lord Erskine. He died in Shrewsbury, Pa., Feb. 10, 1786.

CADZAND, or **CADSAND**, a small port of Zeeland, in Holland, near the Belgian frontier. It was a great medieval port; and here in 1337 the English, under Sir Walter Manny and the Earl of Derby, defeated the Flemings in French pay.

CÆCUM, the beginning of the great gut, commonly called the blind-gut, because it is perforated at one end only; it is the first of the three portions into which the intestines are divided. Also a genus of mollusks, by some considered to be the type of the family cæcidiae, but generally placed under the family turritellidae. The species are recent or tertiary, commencing in the Eocene period.

CAEDMON (kad'mon), an English poet; styled "the father of English song" on account of his epics of sacred history, written in old Northumberland dialect, mostly without titles, although one is called "Genesis." He died in 680.

CAEN (kon), a town of France, in Normandy, capital of the department of Calvados, 125 miles N. W. of Paris, and about 9 miles from the mouth of the Orne, which is here navigable. There is a dock connected with the sea by a canal as well as by the river. It is the center of an important trade, the market of a rich agricultural district, and carries on extensive manufactures. One of the finest churches is that of St. Pierre, built in 1308. Two other remarkable churches are St. Etienne or Church of the Abbaye-aux-Hommes, built by William the Conqueror, who was buried in it, and La Ste. Trinité or Church of the Abbaye-aux-Dames, founded by the Conqueror's wife. The buildings of the former abbaye are now used as a college, of the latter as a hospital. Other buildings are the castle and the hôtel de ville. There is a public library of over 100,000 volumes, and a botanic garden. Lace is largely made here. Valuable building stone is quarried. Pop. about 48,000.

CAERLEON (kär-lē'on), a town of England, on the Usk, 18 miles S. of Monmouth. This was the *Isca Silurum*

of the Anglo-Romans, and was then of great importance, being the capital of the province of *Britannica Secunda* (modern Wales). At a later period it was famous as a seat of learning, and, in the 12th century, Giraldus Cambrensis gave a lively picture of its wealth and magnificence. Many fine Roman remains have been, and are still, found here. Pop. about 2,000.

CÆSALPINIA, the typical genus of the leguminous sub-order *cæsalpinieæ*. They are trees or shrubs, with showy yellow flowers, 10 stamens, and bipinnatifid leaves. About 50 species are known. The intensely astringent *C. coriaria* has legumes which contain so much tannin that they are valuable for tanning purposes. They are known in commerce as dividivi, libidivi, or libidibi, and come from the West Indies and South America. *C. crista*, also West Indian, *C. Echinata*, from Brazil, and other species, produce valuable red, orange, and peach blossom dyes. The wood of the latter, given in powder, is tonic. *C. brasiliensis*, which, however, is not from Brazil, and is now called *Pelophorum Linnæi*, is said to produce the Brazil-wood of commerce. *C. Sappan*, from India, furnishes the sappan-wood. An oil is expressed from the seeds of *C. oleosperma* and other species. The roots of *C. nuga* and *C. moringa* are diuretic; the seeds of *C. bonducella* are intensely bitter. Several Chinese species bear soap-pods, that is, pods which may be used as a substitute for soap.

CÆSALPINIEÆ, one of the great sub-orders into which the leguminosæ are divided. They have an irregular flower, but not at all so much so as the papilionaceæ. The petals are spreading, the stamens adhere to the calyx. They are mostly 10 in number, though in rare cases less than five. They have purgative qualities. They constitute a notable and attractive feature of the vegetation in tropical countries.

CÆSALPINUS (ses-al-pi'nus), the Latinized form of the name of Andrea Cesalpino, an eminent botanist and physiologist, born in Arezzo, in Tuscany, in 1519. He made his studies at Pisa, afterward lectured there, and had charge of the botanical museum. He died in Rome in 1603. His fame depends on his work, "Sixteen Books on Plants" (Florence, 1583), which commenced a new epoch in systematic botanical science.

CÆSAR, the name of a patrician family of the Julian gens, claiming de-

scent from Iulus, son of Æneas. The origin of the surname Cæsar is uncertain.

CÆSAR, CAIUS JULIUS, son of a Roman prætor of the same name, was born July 12, 102 B. C. His circumstances and connections made him a resolute adherent of the democratic party at Rome. His aunt Julia was wife of Caius Marius; and in 83 B. C. Julius himself was married to Cornelia,

back to Rome, where he found the popular party in a state of great ferment, and anxious to regain what it had lost under the vigorous despotism of the aristocratic dictator. Cæsar, however, took no part in the attempts of Lepidus to overthrow the oligarchy; but he showed his political leanings by prosecuting (77 B. C.) Cnaeus Dolabella—a great partisan of Sulla—for extortion in his province of Macedonia. To improve his eloquence, he went to Rhodes to study under the rhetor Apollonius Molo.

In 74 B. C. he returned to Rome, where he had been elected pontifex, and now for the first time threw himself earnestly into public life. He soon became the most active leader of the democratic party, and had a large share in effecting the agreement by which Pompey and Crassus accepted the popular policy. The result was the overthrow of the Sullan constitution in 70 B. C., and the restoration of popular institutions such as the tribunate. In 68 B. C. Cæsar obtained a quæstorship in Spain. On his return to Rome (67 B. C.), he married Pompeia, a relative of Pompey, with whom he was daily becoming more intimate. In 65 B. C. he held the curule aedileship, and lavished vast sums of money on games and public buildings, by which he increased his already great popularity. For the next few years Cæsar is found steadily active on the popular side. In 63 B. C. he was elected pontifex maximus, and shortly after prætor. During the same year occurred the famous debate on the Catiline conspiracy, in which the aristocratic party vainly endeavored to persuade the consul, Cicero, to include Cæsar in the list of conspirators. In 61 B. C. Cæsar obtained the province of Hispania Ulterior. His government of that province was useful to him as giving him military experience and supplying the means wherewith to meet his enormous debts. On his return he was elected consul, along with Calpurnius Bibulus.

With rare tact and sagacity Cæsar reconciled the two most powerful men in Rome, who were then at variance, Pompey and Crassus, and formed an alliance with them, known in history as the First Triumvirate (60 B. C.). Cæsar's proceedings during his consulship were marked by this policy of friendship to Pompey. To strengthen the union which had been formed, Cæsar gave Pompey his daughter Julia in marriage, though she had been promised to Brutus. On the expiration of his term of office, he obtained for himself, by the popular vote, the province of Gallia Cisalpina and Illyricum for five years, to



JULIUS CAESAR
From a bust in the British Museum

daughter of Lucius Cinna, one of the principal enemies of Sulla. The anger of the dictator at this marriage cost Cæsar his rank, property, and almost his life itself. Feeling that he would be safer abroad for a time, he went to Asia, 81 B. C.; but on learning of the death of Sulla (78 B. C.), he hurried

which the senate added—to prevent the popular assembly from doing so—the province of Gallia Transalpina.

In 58 B. C. Cæsar repaired to his provinces, and during the next nine years conducted those splendid campaigns in Gaul by which he completed the subjugation of the West under the dominion of Rome. In his first campaign he defeated the Helvetii, and also Ariovistus, who with a large number of Germans had settled W. of the Rhine. In 57 B. C. Cæsar broke up the Belgic confederacy and subdued the various tribes composing it, the greatest struggle being with the Nervii. During the winter and the spring following Cæsar stayed at Lucca, where he had a memorable meeting with Pompey and Crassus, and for three years following agreed upon a common policy. It was decided that Pompey and Crassus should be consuls for the year 55 B. C., while the government of Cæsar in Gaul was to be prolonged for a second term of five years till 49 B. C. In the year 56 B. C. followed the subjugation of the Veneti and other peoples of Brittany and Normandy, and the conquest of Gaul might be considered complete. He now undertook a fourth campaign against two German tribes who were about to enter Gaul. He was again successful. In the autumn of the same year (55 B. C.) he invaded Britain; but after a brief stay in the island, returned to Gaul. In 54 B. C. Cæsar opened his fifth campaign by a second invasion of Britain, in which he crossed the Thames, and enforced at least the nominal submission of the British tribes in the S. E. of the island. On his return to Gaul, Cæsar was compelled—on account of the scarcity of corn—to disperse his forces for winter quarters, and this encouraged some of the Gallic tribes to revolt. It led to the first serious reverse which Cæsar sustained in Gaul; a division of 15 cohorts was entirely destroyed by the Eburones. But he was speedily master of the insurrection, and exacted a terrible vengeance on its authors.

Cæsar now returned to northern Italy, that he might be able to communicate more easily and securely with his friends at Rome. That city was gradually becoming more anarchic, the evils of weak government more apparent; the hour for decisive action seemed to be approaching, when there broke out a general rebellion of the Gauls, headed by a young warrior of the Arverni named Vercingetorix. It was in the dead of winter when the news came to Cæsar. Without delay he crossed the Cévennes mountains, though they were

covered with snow to the depth of six feet. The struggle with Vercingetorix was a severe one; at Gergovia, the capital of the Arverni, Cæsar was defeated, and for a time his affairs seemed in a desperate condition. But he managed to unite his forces, and at the siege of Alesia (52 B. C.) crushed the whole hosts of the Gauls. Vercingetorix surrendered himself, and the independence of Gaul was at an end. Only some isolated tribes continued to resist; and next year (51 B. C.) Cæsar proceeded to quell them. This he successfully accomplished and in addition reduced the whole of Aquitania.

In the meantime Pompey had definitely gone over to the senatorial party. Crassus had fallen in Asia in 52 B. C., and thus Cæsar and Pompey were left alone, the two most powerful men of Rome. Pompey was jealous of his younger rival. His natural tendency was to adhere to the old aristocratic party. He now cast in his lot with it, and it was decided to break the power of Cæsar. With this view it was necessary to deprive him of his command in Gaul. During the long maneuvering which followed, Cæsar acted with the greatest moderation, and managed to throw upon his opponents the responsibility of violating the law. Under the direction of Pompey the senate summarily called upon him to resign the command and disband his army. The tribunes Mark Antony and Cassius put their veto on this motion; but they were violently driven out of the senate-chamber, and fearing for their lives, they fled to Cæsar's camp. Things had now come to an extremity. The senate intrusted Pompey with the duty of providing for the safety of the state. His forces far outnumbered Cæsar's legions, but they were scattered over the provinces of the empire, and the Italian levy was unprepared. In face of an enemy of such marvellous promptitude and energy as Julius Cæsar this dilatoriness was fatal. Perceiving that the time for energetic action had at length arrived, Cæsar harangued his victorious troops, who were willing to follow him anywhere; crossed the Rubicon (a small stream which separated his province from Italy proper), and moved swiftly southward. Pompey fled to Brundusium, pursued by Cæsar, but contrived to reach Greece in safety, March 17, 49 B. C. The Italian cities everywhere opened their gates to the conqueror. In three months Cæsar was master of all Italy.

Cæsar next subdued Pompey's legates in Spain, who were at the head of con-

siderable forces. On his return, he took Massilia, where he learned that he had been appointed dictator of the Republic—a function which at this time he retained only for 11 days, but these were honorably distinguished by the passing of several humane enactments. Pompey, now thoroughly alive to the magnitude of his danger, had gathered in Egypt, Greece, and the East, a powerful army, while his fleet swept the sea. Cæsar, however, crossing the Adriatic at an unexpected season, made a rush for Dyrrachium, where Pompey's stores were; but was nevertheless outstripped by his opponent. Pompey intrenched his army on some high ground near the city, where he was besieged by Cæsar. The first encounter was favorable to Pompey, who drove back Cæsar's legions with much loss. The latter now advanced into Thessaly, followed by his exulting enemies. A second battle ensued on the plains of Pharsalia, Aug. 9, 48 B. C. The senatorial army was utterly routed, and Pompey himself fled to Egypt, where he was murdered.

No sooner had the news reached Rome that Cæsar was again appointed dictator for a year, and consul for five years. He was invested with tribunician power for life, and with the right of holding all the magistratival comitia, except those for the election of the plebeian tribunes. He did not, however, return to Rome after the battle of Pharsalia, but went to Egypt, then in a distracted condition on account of the disputes regarding the succession. Out of love for Cleopatra (who subsequently bore him a son), he entered upon the "Alexandrine War," in which he was successful, and which he brought to a close in March, 47 B. C. He next overthrew a son of Mithridates, near Zela, in Pontus, August 2 of the same year, and arrived in Rome in September. He was once more appointed dictator, and the property of Pompey was confiscated and sold. Before the close of the year he had set out for Africa, where his campaign against the Pompeian generals, Scipio and Cato, was crowned with victory at the battle of Thapsus, April 6, 46 B. C. Cato committed suicide at Utica, and with such irresistible celerity was the work of subjugation carried on, that by the end of the summer Cæsar was once more in Rome. Now occurred that display of noble and wise generosity for which Cæsar may be regarded as truly great. He was not a man that could stoop to the vulgar atrocities of Marius or Sulla; he majestically declared that henceforth he had no enemies, that he would make no difference

between Pompeians and Cæsarians. His victories in Gaul, Egypt, Pontus, and Africa were celebrated by four great triumphs, during which the whole Roman populace was feasted and feted by the magnificent liberality of the dictator.

Cæsar now proceeded with his schemes for the settlement of affairs at Rome. During the year 46 B. C. he conferred a benefit on Rome and on the world by the reformation of the calendar, which had been greatly abused by the pontifical college for political purposes. After quelling an insurrection which broke out in Spain, where Pompey's sons, Cneius and Sextus, had collected an army, he received the title of "Father of his Country," and also of *imperator*, was made dictator and *praefectus morum* for life, and consul for 10 years; his person was declared sacred, and even divine; he obtained a bodyguard of knights and senators; his statue was placed in the temples; his portrait was struck on coins; the month Quintilis was called Julius in his honor, and on all public occasions he was permitted to wear the triumphal robe. He proposed to make a digest of the whole Roman law for public use, to found libraries for the same purpose, to drain the Pontine Marshes, to enlarge the harbor of Ostia, to dig a canal through the Isthmus of Corinth, and to quell the inroads of the Barbarians on the E. frontiers; but in the midst of these vast designs he was cut off by assassination on the Ides (15th) of March, 44 B. C. Of Cæsar's writings the "Commentaries" on the Gallic and Civil Wars have alone been preserved.

CÆSAREA (sez-a-re-ä), the ancient name of many cities, such as: (1) CÆSAREA PHILIPPI in Palestine, N. of the Sea of Galilee, rebuilt by Philip, tetrarch of Galilee, son of Herod the Great. (2) CÆSAREA, on the shores of the Mediterranean, about 55 miles N. W. from Jerusalem, enlarged and beautified by Herod the Great, and named in honor of Cæsar Augustus; the place where St. Paul was imprisoned two years (Acts xxiii-xxv). (3) The capital of Cappadocia, in Asia Minor.

CÆSARIAN OPERATION, the most serious operation in midwifery, and only resorted to in extreme cases, to save life; as, for example, when a woman fully pregnant dies suddenly, by accident or otherwise, the child being still alive *in utero*; or when, by reason of deformity, the birth cannot take place naturally or with the aid of ordinary obstetrical instruments, *per naturales vias*. The operation consists in making an incision in the abdomen and remov-

ing the child with the contents of the womb *en masse*, and then sewing up the wound thus made in the usual way. As might be expected, the danger is very great to the living mother. In modern times the operation has lost much of its danger as a result of the improvements in modern surgery, particularly in the knowledge of the correct use of antiseptics, as the great danger lies in septicæmia ensuing. The Caesarian operation is of very ancient origin, being known to the Greeks and called by them *hysteratomotoke*. The Romans also practiced it, and it was considered by them a fortunate circumstance to be so born.

CÆSARION, son of Julius Cæsar and Cleopatra, put to death by order of Augustus.

CÆSARS, THE ERA OF, also known as the Spanish Era, a period of time reckoned from Jan. 1, 38 B. C., being the year following the conquest of Spain by Augustus. It was much used in Africa, Spain, and the S. of France; but by a synod held in 1180 its use was abolished in all the churches dependent on Barcelona. Pedro IV. of Arragon abolished the use of it in his dominions in 1350. John of Castile did the same in 1383. It was used in Portugal till 1415, if not till 1422. The months and days of this era are identical with the Julian calendar, and to turn the time into that of our era, subtract 38 from the year; but if before the Christian era, subtract 39.

CÆSURA (sē-zū'rā), in Latin verse the separation of the last syllable of any word from those which precede it, by making it part of the following foot. In English poetry it is equivalent to a pause.

CAFFEINE, symbol, $C_8H_{10}N_0_2$; the same as theine; a feeble organic base occurring in tea, coffee, and the leaves of *Guarana officinalis* and *Ilex paraguayensis*. A decoction of tea is mixed with excess of basic lead acetate, filtered, then H_2S is passed in to precipitate the excess of lead, evaporated, then neutralized by ammonia; the caffeine crystallizes out on cooling. It forms tufts of white, silky needles; it has a bitter taste; it forms double salts with platinum and gold chlorides. It is a methyl substitution compound of theo-bromine, and is used as a nerve sedative and a hypnotic.

CAGAYAN (kä-giän'), an island of the Philippine group; the largest of six small islets, known as the Cagayan-Sulu group. It is about 5 miles wide and 8 miles long.

CAGLIARI (käl-yär'ē), the capital of the island of Sardinia, at the head of a fine bay on the S. coast. It is the residence of the Viceroy and of an Archbishop, and the seat of a university. It has some manufactures, and is the chief emporium of all the Sardinian trade. Its spacious and safe harbor is defended by several forts. Pop. about 60,000.

CAGLIARI, PAULO. See VERONESE, PAUL.

CAGLIOSTRO (käl-yos'trō), COUNT ALESSANDRO (real name, GIUSEPPE (JOSEPH) BALSAMO), an Italian charlatan; born in Palermo, June 8, 1743. He was the son of poor parents, and entered the order of the Brothers of Mercy, where he acquired a knowledge of the elements of chemistry and physic. He left, or had to leave, the order, and committed so many crimes in Palermo that he was obliged to abscond. He subsequently formed a connection with Lorenza Feliciani, whose beauty, ability, and want of principle made her a valuable accomplice in his frauds. With her he traveled through many countries, assuming other names besides that of Count Cagliostro, pretending to supernatural powers, and wringing considerable sums from those who became his dupes. In 1789 he revisited Rome, where he busied himself about freemasonry; but being discovered, and committed to the Castle of St. Angelo, he was condemned by a decree of the Pope to imprisonment for life as a freemason, an arch-heretic, and a very dangerous foe to religion. He died in prison in San Leone, Aug. 25, 1795.

CAHILL, THADDEUS, an American inventor, born in Iowa in 1867. He studied at Oberlin College, took a law course at George Washington University, and was admitted to the bar in 1894. His natural bent was toward mechanics, however, and he never engaged in law practice. He invented electric typewriter and the telharmonium, a contrivance that produces music electrically by vibrations transmitted by dynamos from a central station to receiving telephones.

CAICOS (kī'kōs), a group of islands belonging geographically to the Bahamas, but annexed in 1874 to Jamaica. The North, West, East, Grand, and other Caicos, have, together with Turk Islands, an area of 223 square miles. Pop. about 6,000. Salt and sponges are their chief products.

CAILLOUX, JOSEPH, a French statesman, born in Mans in 1863. He embraced the law as a profession, but

soon became engrossed in politics, for which he had remarkable aptitude. He served several terms for Sarthe in the Chamber of Deputies and rapidly rose to eminence in debate. Between 1899 and 1911 he was three times Minister of Finance in various cabinets. In 1911 he became Premier and Minister of the Interior. On Dec. 8, 1913, he became Minister of Finance for the fourth time. Various incidents in the handling of the affairs of his office caused him to be accused of political corruption, and a fierce campaign was waged against him by influential journals of the opposition, that of "Figaro" being notable for its bitterness. The editor of the latter was shot and killed in his office, March 16, 1914, by Madame Caillaux (see Calmette) on the ground that he was about to publish private correspondence reflecting on her character. As the result of the tragedy, Caillaux was forced to resign his office as Finance Minister. The World War followed soon after, and here again Caillaux's name was connected with some ugly stories of graft and peculation in army supplies. In December of 1917 he with others was arrested and held for trial on the charge of carrying on treasonable correspondence with the enemy. It was shown that he had been more or less intimate with BOLO PASHA (*q. v.*) and the group of conspirators connected with the "Bonnet Rouge," and there were suspicious circumstances connected with visits of his to Argentina and to Italy. The trial was postponed from time to time, partly because the war engrossed so much of the nation's activity, and no doubt also because of the formidable following among the Socialist element that Caillaux still had, despite the charges brought against him. It was not until after the war that he was brought to trial in 1920. He was convicted after a notable defense, condemned to a term of imprisonment, against which the time he had already spent in jail was credited and to the forfeiture of civil rights for a period of five years. He was also forbidden to live in the department of the Seine for ten years.

CAIN, the first-born of the human race, and the first murderer. He became an outcast, traveling to the E. of Eden, where he built a city and had a son, named Enoch. The Jewish tradition is that he was slain by Enoch.

CAINE, SIR (THOMAS HENRY) HALL, an English novelist and dramatist; born in Runcorn, Cheshire, Eng., May 14, 1853; began his career as an architect in Liverpool. Contributions to the "Builder" and the "Building News"

resulted in his becoming connected with journalism, and eventually he joined the staff of the "Liverpool Mercury," and wrote in the "Academy" and the "Atheneum." He resided with Dante Rossetti in London till the poet's death. Among his non-fictional publications are: "Sonnets of Three Centuries"; "Recollections of Rossetti"; "Cobwebs of Criticism"; "My Story." His skill as a novelist has been since exemplified in "The Shadow of a Crime" (1885); "A Son of Hagar" (1886); "The Deemster" (1887); "The Bondman" (1890); "The



SIR T. H. HALL CAINE

"Scapegoat" (1891); "The Manxman" (1894); "The Christian" (1897); "The Eternal City" (1901); "The Prodigal Son" (1904); "The White Prophet" (1909); "The Woman Thou Gavest Me" (1913); etc. Most of these had very large sales, both in England and in the United States, and were almost equally successful when dramatized or filmed. "The Christian" provoked much discussion, the verdict in England being generally unfavorable to the motive of the book, while in the United States it was generally favorable. It was immediately translated into most of the languages of Europe, and provoked the same divided opinion everywhere. He traveled in Iceland (1890), in Russia (1892), on behalf of the persecuted Jews; and in 1895 visited the United States and Canada, where he represented the Society of Authors, and obtained important concessions from the Canadian Parliament as to the Cana-

dian copyright demands. In 1898 he visited the United States again. He took a prominent part in the public affairs of the Isle of Man and was knighted in 1918. During the World War he was prominently engaged in literary propaganda.

CA IRA (sä ē-rä'), a popular song which arose in the fever of the French Revolution, so named from its refrain:

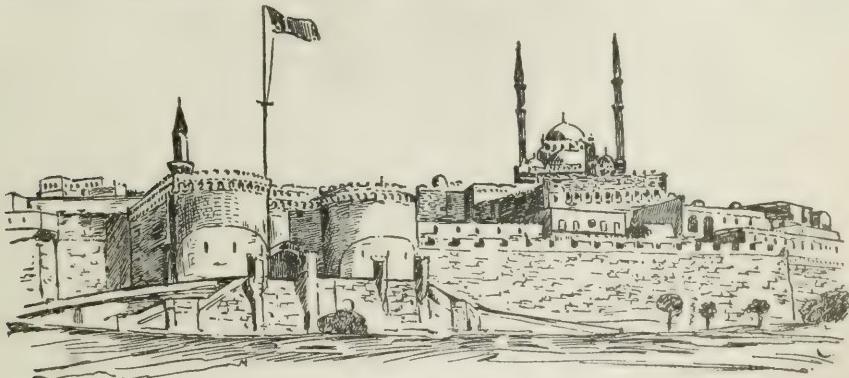
Ah! ça ira, ça ira, ça ira!
Les aristocrates à la lanterne!
("Ah! it will go, it will go, it will go!
To the lamp-post with the aristocrats!")

Like the "Marseillaise," the "Carmagnole," and the "Chant du Départ," it became a French national song, and was styled the "Carillon National." The words, which are worthless rubbish enough, were due to a street singer named Ladré; the melody to Becourt, a stage drummer. The song was prohibited by the Directory in 1797.

CAIRN, a round or conical heap of stones erected as a sepulchral monument. They are found on the hills of England, Wales, and Scotland, and some have assigned to them a peculiar character, as receptacles for the bodies of criminals burnt in the wicker images of the Druids, etc. According to some antiquaries, cairn is distinct from carnedd, the Welsh name for heaps of stones on the tops of high mountains (Carnedd David, Carnedd Llewellyn, etc.), which

capital of modern Egypt, situated in a sandy plain between the right bank of the Nile and the ridge of Mokattam, near the point of the delta of the Nile. The most remarkable buildings in the city are its minarets and mosques. The minarets are the most beautiful of any in the Levant, of a prodigious height, and built of alternate layers of red and white stone. The most ancient of all the minarets is that attached to the great mosque of Sultan Taylooin. This mosque was built in the year of the Hegira 265 (879 A. D.) before the foundation of the city, and consists of an immense cloister or arcade built on pointed arches, being the earliest extant in that form.

The city proper is built on the slope of one of the lowest ridges of the Jebel Mokattam, and is surrounded, N. and E., by old walls, and the highest part of the ridge is occupied by a citadel commanded by forts on the mokattam, and containing the palace of the viceroy, the arsenal, mint, public offices, and the magnificent new mosque of Mehemet Ali. The city is separated from its suburbs Bulak and Masr-el-Atiqa by a series of gardens and plantations, chief of which is the Ebzékiah. Bulak, the port of Cairo, is connected with it by a railway; it was built in 1313 on land deposited by the river. At Bulak is the celebrated museum of antiquities; an un-



CITADEL OF CAIRO

are said to have been sacrificial. Some cairns are undoubtedly sepulchral. In common language, a cairn is distinguished from a barrow, the former being a heap of stones, the latter a mound of earth; but in all probability they had for the most part the same object, and the difference of materials was merely occasioned by local circumstances.

CAIRO (kī'rō) (Arab. Musr el Kaherah, "the victorious capital"), the

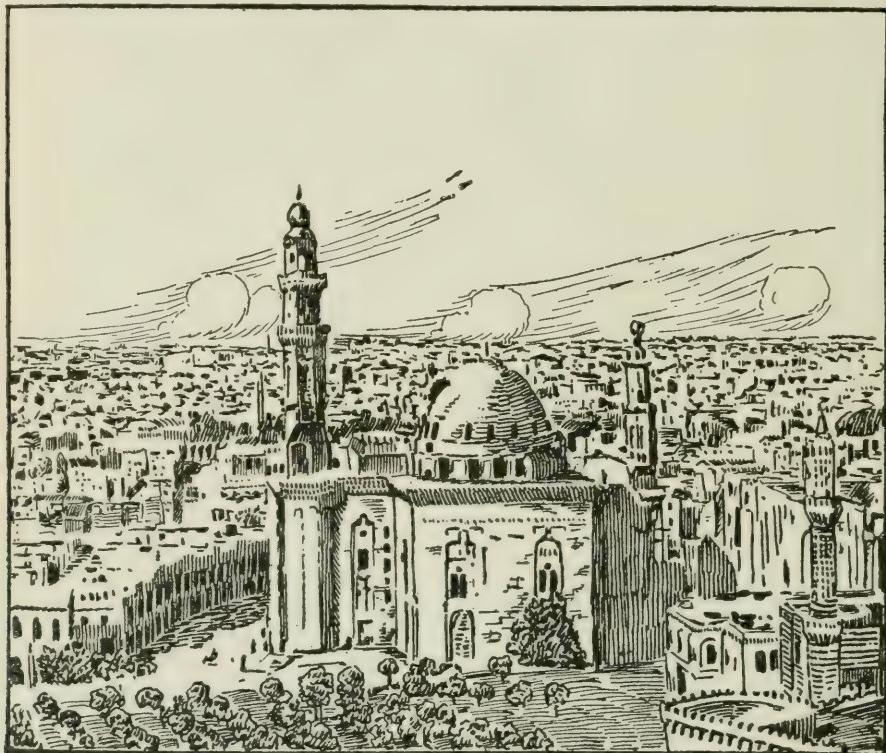
equalled collection of Egyptian remains of unique historical interest. Cairo is divided into several distinct quarters, as Coptic, Jewish, and Frank quarters, which were formerly separated by gates. The new quarter, called Ismailiyeh, the residence of Europeans and wealthy natives, has many of the houses in the Italian style, with large gardens attached.

The remarkable edifices of Cairo com-

prise many of the finest remains of Arabian architecture, all dating from the time of the ancient sultans of Egypt. Among these, besides mosques, chapels, and Coptic churches, are several of the ancient gates, an aqueduct for conveying water from the Nile to the citadel, the works of the citadel, and the palace and well of Joseph. At Old Cairo are the seven towers, still called the "Granary of Joseph," and serving their ancient purpose. In the island of Rhoda is the celebrated Nilometer. On the S., outside the walls, are the tombs of the Mamelukes, and on the N. E. the obelisk of Heliopolis. There are also a public

been founded till about 970; its citadel was built by Saladin in 1176, and it was the capital of the sultans of Egypt till the time of the Turkish conquest in 1517; since that time it has been the residence of the pashas, governors of the province. It was taken by the French in 1798, and held by them for more than three years. Pop. about 800,000.

CAIRO, a city port of entry, and county-seat of Alexander county, Ill.; at the confluence of the Ohio and Mississippi rivers, and on the Illinois Central, the Mobile and Ohio, the St. Louis, Iron



CAIRO, EGYPT

library containing a splendid collection of illuminated copies of the Koran; a magnetic observatory, and the Mohammedan college of El Ahzar (originally a mosque), the principal university of the Mohammedan world, attended by 8,000 to 10,000 students from all parts of the East. The suburb of Masr-el-Atiqah, or Old Cairo (first called Fostat, "tent-town"), was the site of the original Cairo, founded about 642 by the Sultan Amru, the town on the present site, a little to the N. of Old Cairo, not having

Mountain and Southern, the Cleveland, Cincinnati, Chicago and St. Louis and the St. Louis Southwestern railroads; 150 miles S. E. of St. Louis. It is the trade center of southern Illinois, and has freight and passenger steamer communications with all river ports, important manufactures, daily and weekly newspapers, national banks, etc. Pop. (1910) 14,548; (1920) 15,203.

CAISSON, a military term, denoting a wooden chest to hold ammunition;

formerly applied to the ammunition-wagon itself. Also a wooden box containing shells and loose powder, which was buried in the ground and ignited by means of a fuse when the enemy was passing over it. In engineering a caisson is a wooden, metal, or concrete case or frame sunk in the beds of rivers, etc., to keep out the water during the laying of the foundations of a bridge, etc. It is constructed of strong timbers, or other material, firmly and closely joined together. The term in architecture is applied to sunk panels of various geometrical forms symmetrically disposed in flat or vaulted ceilings, or in soffits generally.

CAITHNESS, a county of Scotland, forming the northernmost part of that country. It has an area of 697 square miles. For the most part it is bare and level and without trees. The sea-coast is indented and has many bays and inlets. The chief products are grain, barley, and vegetables. It has also a considerable fishing industry. The county town is Wick. Pop. about 35,000.

CAJAMARCA (kä-hä-mär'kä), a department in the N. W. of Peru, between the W. chain of the Andes and the Amazon. A railway connects it with the Pacific, and there is a large farming and cattle-raising industry. Area, 12,538 square miles; pop. about 500,000. The capital is Cajamarca; pop., 10,000.

CALABAR, a maritime district of west Africa on the bight of Biafra, intersected by two rivers, called respectively Old and New Calabar, under English protection. A large portion of the population are employed in the palm-oil trade. Old Calabar or Bongo river is situated about 90 miles nearly due W. from New Calabar river, with a wide estuary opening into the bight of Biafra. This river enters the bight of Biafra at lon. $7^{\circ} 7'$ E., and is believed to be one of the numerous terminating branches of the Niger. Duke Town and Creek Town, the chief towns on Old Calabar river, are stations of British missionaries.

CALABASH, a tree, the *Crescentia Cujete*, the typical one of the order *Crescentiaceæ*, or crescentiads. It is a tree about 30 feet high, found in some places wild, in others cultivated, in the West Indies and other tropical parts of America. Its flowers are variegated with green, purple, red, or yellow; its leaves are narrowly elliptical. Its fruits are oval or globular, and are so hard externally that where they grow they are used as household utensils such

as basins, water bottles, and even kettles. They are not easily broken by rough usage or burnt by exposure to fire. The pulp is purgative, and considered useful in chest diseases; when roasted, it is employed as a poultice for bruises and inflammations. The fruit of the tree is inclosed in a shell used by the natives of the Caribbean Islands for drinking cups, pots, musical instruments, and other domestic utensils.

CALABRIA, a name anciently given to the peninsula at the S. E. extremity of Italy, but now applied to the S. W. peninsula in which Italy terminates, from about lat. 40° N. to the Strait of Messina; area, 5,819 square miles; pop. about 1,500,000. It is divided into three provinces—Cosenza, Reggio, and Catanzaro. The central region is occupied by the great Apennine ridge, to which whole colonies with their cattle migrate in the summer. The flats near the coast are marshy and unhealthy, but the valleys at the foot of the mountains are rich with the most luxuriant vegetation. The country is subject to earthquakes and suffered severely in 1905 and 1908. Wheat, rice, saffron, anise, liquorice, madder, flax, hemp, olives, almonds, and cotton are raised in abundance. The sugar-cane also comes to perfection here. Sheep, horned cattle, and horses are numerous. Silkworms are extensively raised. The minerals include alabaster, marble, gypsum, alum, chalk, rock-salt, lapis-lazuli, etc. The fisheries are valuable.

CALADIUM, a genus of endogenous plants, the typical one of the family *caladieæ*. They are cultivated in greenhouses here, and flourish in warmer parts of the world. The leaves of the *Caladium sagittifolium* are boiled and eaten as a vegetable in the West Indies. The rootstocks or rhizomes of others are eaten there and in the Pacific, the process of cooking destroying the dangerous acridity.

CALAIS, a city, port of entry, and county-seat of Washington county, Me.; on the St. Croix river, opposite St. Stephen, N. B., and on the St. Croix and Penobscot and the Canadian Pacific railroads; 120 miles E. of Bangor. It is the extreme N. E. seaport of the United States and is connected by steamship lines with Boston, Portland, and St. John, N. B. It has a large lumber trade and numerous foundries, machine shops, shipyards, and other extensive mechanical industries; a national bank, several newspapers, high and grammar schools, electric lights, a public library, etc. Pop. (1910) 6,116; (1920) 6,084.

CALAIS (kä-lä'), a fortified seaport town of France, in the department of Pas-de-Calais, on the Strait of, and 25 miles S. E. of Dover, and distant 184 miles by rail from Paris. The Old Town or Calais proper has a citadel, and was formerly surrounded by fortifications; but the modern suburb of St. Pierre les Calais having been amalgamated with Calais proper, both are now surrounded with forts and other works, to which morasses lend additional strength. Extensive harbor improvements have been carried out. Calais has considerable exports of grain, wine, and spirits, eggs, fruit and vegetables; but the town derives its principal importance from its being the chief landing place for English travelers to the Continent. It has important manufactures of cotton and silk bobbinet lace. In 1347 Calais was taken by Edward III. of England, after a siege of 11 months. In 1558 it was retaken by the Duke of Guise, being the last relic of the French dominions of the Plantagenets, which at one time comprehended the half of France. In the World War it played an important part as a port of embarkation and disembarkation for the British forces in France and Belgium. It was shelled by German destroyers and bombed by German aeroplanes at numerous occasions, without, however, suffering severe losses, either in life or property. Pop. about 75,000.

CALAMBUCO, a very durable tree, indestructible by ants, used for shipbuilding and farming implements; grows in the island of Luzon, Philippines.

CALAMIANES (kä-lä-mē-ä'nes), an island group of the Philippine Archipelago. Their surface is mountainous, and richly wooded, producing rice, wool, cacao, and the bird's nests used for food. Busuanga, Calamian, and Linacapan are the largest of the 98 islands. Area about 677 square miles; pop. about 20,000.

CALAMUS, the reed pen which the ancients used in writing, made of the stem of a reed growing in marshy places, probably *Arundo Donax*, of which the best were obtained from Egypt. The stem was first softened, then dried, and cut and split with a knife (scalprum librarium), as quill pens are made. To this day the Orientals generally write with a reed (Arab. *Kalām*).

CALAMUS, the traditional name of the sweet flag (*acorus calamus*), which is no doubt the "calamus aromaticus" of Roman authors, and probably the sweet

calamus and sweet cane of Scripture, although it has sometimes been attempted to identify calamus with one of the fragrant grasses which yield the grass-oil of India. The sweet flag, although resembling Iris in habit, belongs to the order *Aroidæ*, and is widely distributed through the Eastern palæarctic region, and is also indigenous to North America. The root-stock yields an aromatic stimulant and tonic, which has fallen into disuse in regular medicine, but is still of high repute in the East. It is in fact cultivated in Ceylon and Burma. It is sometimes used to flavor beer, and in the perfuming of tooth powder and snuff; and was masticated to clear the voice and sweeten the breath. It is also made into confections and used in the preparation of liqueurs in Germany, etc. The plant was formerly used to strew floors instead of rushes, and particularly in cathedrals on festival days. The name calamus is also given to a genus of palms.

CALANUS (kal'a-nus), an Indian philosopher much esteemed by Alexander the Great. At the age of 73 (B. C. 323), being seized with illness at Pasargada, he caused a funeral pile to be erected, which he ascended with a composed countenance, and expired in the flames, saying, that having lost his health and seen Alexander, life had no more charms for him.

CALATAFIMI (kä-lä-tä-fé'më), a town of Sicily near its W. end, with a ruined Saracenic castle. Near it is the scene of Garibaldi's first victory over the Neapolitans in 1860. Pop. about 11,000.

CALATRAVA LA VIEGA (vyä'gä), a ruined city of Spain, on the Guadiana, 12 miles N. E. of Ciudad Real. Its defense against the Moors, undertaken by Raymond, abbot of Fitero, and Diego Velasquez in 1158, after it had been abandoned by the Templars, is famous on account of its having originated the Order of the Knights of Calatrava, which was instituted at Calatrava in 1158, by King Sancho III. of Castile, and was at several periods associated with the Cistercian monks. Their almost uniform success against the Moors gave rise to rashness, and in 1197 they were defeated and nearly exterminated, the survivors transferring the seat to the castle of Salvatierra. In 1523 the grand-mastership was transferred to the crown by a papal bull, the knights being permitted to marry once by way of compensation for their loss of independence. Since 1808 the body has been continued as an order of merit.

CALCAREOUS, a term applied to substances partaking of the nature of lime, or containing quantities of lime. Thus we speak of calcareous waters, calcareous rocks, calcareous soils. Calcareous spar, crystallized carbonate of lime. It is found crystallized in more than 700 different forms, all having for their primitive form an obtuse rhomboid. The rarest and most beautiful crystals are found in Derbyshire, England.

CALCAREOUS TUFa, a deposition from springs, streams, or underground water, from which it is precipitated partly by the escape of carbonic acid which acts as a solvent, and partly by evaporation of the water. It is usually white, creamy-white, yellowish, or brownish in color, but other hues occur, and variegated and mottled varieties are not uncommon. It is of variable texture and consistency; some kinds being rather soft, brittle, and friable, and porous or cellular. These cellular varieties have been deposited from the waters of springs, and often contain vegetable and animal remains, as leaves, twigs, nuts, moss, insects, land and fresh-water shells, etc. The so-called "petrifying springs" of Matlock afford a good example of the formation of calcareous tufa. In some regions the deposition from calcareous waters is on a very extensive scale, as along the river Anio, at Tivoli, near Rome, where calcareous tufa occurs in masses many feet in thickness. In that district the formation is harder and more compact, and under the name of *travertino* is used as a building stone at Rome. Calcareous tufa is abundantly deposited from thermal springs, as in the Yellowstone region of the United States. The calcareous incrustations so commonly seen in caverns in limestone rocks are varieties of calcareous tufa. They are known as stalactites and stalagmites.

CALCEOLARIA, a well known and beautiful genus of plants—order *Scrophulariaceæ*. The resemblance to a shoe is in the bilabiate corolla of the best known species, the elongated lower lip of which is inflated and turned down. The stamens are only two. The species, which are numerous, come from South America, chiefly from the western slope or side of the Andes. The greater number have yellow flowers, others are purple, while in a few the two colors are intermingled. The roots of *Calceolaria arachnoida* are collected in Chile, where they are called *relbun*, and are used for dyeing woolen cloth crimson. Various calceolarias are cultivated in the United States.

CALCHAS (kal'kas), a celebrated soothsayer, son of Thestor, lived in the 12th century B. C. He accompanied the Greeks to Troy, in the office of high priest, and prophesied the principal events which were destined to take place regarding that doomed city. He had received the power of divination from Apollo, and was informed that as soon as he found a man more skilled than himself, he must perish. This happened near Colophon, after the Trojan war. He was unable to tell how many figs were on the branches of a certain tree; and when Mopsus mentioned the exact number, Calchas died through grief.

CALCIFEROUS EPOCH, one of the subordinate divisions of the Lower Silurian System of North America. The division is characterized by the presence of calcareous sandstones and limestones. In Scotland a subdivision of the Carboniferous system is known as the Calciferous Sandstone group.

CALCITE, CALCAREOUS SPAR, or CALC-SPAR, the name usually given by mineralogists to carbonate of lime, rhombohedral in its crystallization. It differs from aragonite only in crystallization. Calcite is one of the commonest minerals. Marble, for example, is composed of small crystalline granules of this mineral. It is abundantly met with in very many rocks as a secondary mineral; that is to say, it is a decomposition product—the result of the chemical alteration of various rock-constituents, such as the feldspars. Thus it frequently occurs in the cracks, fissures, and vesicles of igneous rocks. The name Iceland spar has often been given to calcite, at least to the finest colorless and transparent variety, because it is found in Iceland, filling up clefts and cavities in the basalt-rocks of that region. Slate spar is a lamellar variety, often with a shining, pearly luster and a greasy feel, and is found in Wicklow in Ireland, Glen Tilt in Scotland, and Kongsberg in Norway.

CALCIUM, a dyad metallic element. Symbol, Ca; at. wt., 40; sp. gr., 1.57; obtained by Davy by decomposing the chloride by electricity; also by heating the iodide with sodium in a closed vessel. Calcium is a yellowish white, ductile, malleable metal, which oxidizes in damp air; it decomposes water, and dissolves easily in dilute acids. Heated in the air, it melts at red heat, and burns with a bright orange-red light. Calcium occurs in nature chiefly as a carbonate, silicate, and sulphate. Calcium oxide, CaO, called also lime, is obtained by heating the carbonate of calcium to red-

ness. It is a white, earthy, infusible powder, phosphorescent at high temperatures; it is strongly alkaline, and readily absorbs carbonic anhydride. It unites vigorously with water, throwing out great heat, and forms a hydrate, CaOH_2O , which is slightly soluble in cold water; it is used in medicine as lime-water. Impure lime mixed with sand forms mortar.

Calcium sulphate, CaSO_4 , found as hydride of gypsum, $\text{CaSO}_4\cdot 2\text{H}_2\text{O}$, and selenite and alabaster. The water is given off by heating it, and a white powder is left, which dissolves in 500 parts of cold water. Mixed with water, it sets in a hard substance; it is used under the name of plaster of Paris for making casts of medals and statues, etc.

Calcium carbonate, CaCO_3 , forms the chief constituent of limestone, marble, chalk, etc. It occurs crystallized as calc spar and aragonite. Calcium carbonate is insoluble in water, but is dissolved by water containing carbonic acid gas; it is deposited from this solution by boiling, hence boiler deposits.

Calcium phosphates occur in the bones of animals and are native in Apatite. Calcium chloride, CaCl_2 , is obtained by dissolving the carbonate in hydrochloric acid. It crystallizes in white prismatic crystals; it is very deliquescent. Fused calcium chloride is used to dry gases, etc. It absorbs ammonia gas.

Calcium fluoride, CaF_2 , occurs as fluor spar.

Calcium sulphides and phosphides have been obtained. Salts of calcium are not precipitated by H_2S , either in an acid or alkaline solution. Alkaline carbonates and ammonia carbonate give a white precipitate insoluble in excess; oxalate of ammonia gives a white precipitate from a neutral solution; the precipitate is not soluble in acetic acid. A solution of sulphate of calcium gives no precipitate. The chloride gives an orange-red flame with alcohol. The spectrum of calcium gives several characteristic lines, especially an orange-red and a green line. Chloride of lime, or bleaching powder, is a mixture of calcium chloride and calcium hypochlorite.

CALCIUM CARBIDE, a chemical compound of calcium and carbon, symbol CaC_2 . It is a hard, bluish-black, clear crystalline body, and is impervious to light, insoluble in all known solvents, and with a sp. gr. of 2.22. Although calcium carbide has been known for many years, it did not come into prominence until 1894, when Moissan produced it by heating 120 grains of oxide of calcium and 70 grains of sugar charcoal in an electric furnace. The furnace

was heated to $3,500^\circ \text{ C}$. by an electrical current of 350 amperes and 70 volts for 20 minutes. This produced about 150 grains of carbide. Dry carbide is not affected by heat in an ordinary atmosphere, but when heated in an excess of oxygen it burns and forms calcium carbonate. When exposed to damp air for a short time it disintegrates and gives off a peculiar odor resembling garlic. When calcium carbide comes in contact with water, ACETYLENE GAS (g. v.) is produced and calcium hydroxide thrown down ($\text{CaC}_2 + 2\text{H}_2\text{O} = \text{C}_2\text{H}_2 + \text{Ca}(\text{OH})_2$). It is used generally for the production of acetylene and the reduction of iron.

CALCIUM LIGHT, a brilliant light produced by directing the flame of an oxy-hydrogen blow-pipe against a block of compressed quicklime. It has been used on the stage for many years, and by the aid of colored glasses very charming effects are produced. More recently it was employed in lanterns for projecting photographic and biographic pictures on a screen. It has now been superseded by electric light.

CALCULATING MACHINE, a piece of mechanism for assisting the human intellect in the performance of arithmetical operations. The system of logarithms, invented by the celebrated Napier of Merchiston, in 1614, which is of the greatest assistance to mathematicians and others in the computation of figures, by shortening the ordinary operations, seems to have been instrumental in directing attention to the construction of an instrument by which arithmetical results could be produced by mechanical means, although the abacus had been long used in Europe and Asia for effecting calculations; and Napier himself had produced what may be termed an elementary calculating machine, consisting of rods with four faces, known as Napier's Bones. The first instrument which can be justly called a calculating machine, was invented by Blaise Pascal, in 1642. It was more especially contrived for the calculation of sums of money, although it would also perform the ordinary operations of arithmetic with numbers on the common, or decimal scale of notation. It consisted of a set of cylinders, with numbers marked on their external surface, moving on axles to which wheels were attached, with a certain number of notches cut in their circumference. Among the various machines of later invention, the two devised by Mr. Babbage, but never fully executed, are by far the more elaborate. The invention of the brothers Scheutz was based on the description of Mr. Babbage's difference machine, and is

similar to it in general principles, though it varies from it in some points in the method adopted in its construction. It was purchased by Mr. Rathbone, of Albany, and presented by him to the Dudley Observatory in that city. More modern calculating machines are the slide-rule, adding machines, multiplying and dividing machines, and cash registers, which are described in detail under their several names.

CALCULUS, the medical term for what is popularly known as stone. Calculi vary in size from a pin's head to a pigeon's egg, and even larger, and weigh from a few grains to several ounces. They derive their special name and character as well from the organs of the body in which they are found as from the constituents of which they are composed. Thus, for example, a calculus found in the kidney or ureter is called renal, in the bladder vesical, and so on; but, according to its chemical composition, it would also be called either (1) uric (lithic) acid calculus, or (2) oxalic (mulberry) calculus, or (3) phosphatic calculus. Calculi derived from the bile are also found in the gall-bladder, and in the biliary and intestinal ducts, where they receive the name of gall-stones, or biliary calculi. Those found in the salivary glands are called salivary calculi.

CALCULUS, a branch of mathematical science. The lower or common analysis contains the rules necessary to calculate quantities of any definite magnitude whatever. But quantities are sometimes considered as varying in magnitude, or as having arrived at a given state of magnitude by successive variations. This gives rise to the higher analysis, which is of the greatest use in the physico-mathematical sciences. Two objects are here proposed: First, to descend from quantities to their elements. The method of effecting this is called the differential calculus. Second, to ascend from the elements of quantities to the quantities themselves. This method is called the integral calculus. Both of these methods are included under the general name infinitesimal, or transcendental analysis. Those quantities which retain the same value are called constant; those whose values are varying are called variable. When variable quantities are so connected that the value of one of them is determined by the value ascribed to the others, that variable quantity is said to be a function of the others. A quantity is infinitely great or infinitely small, with regard to another, when it is not possible to assign any quantity sufficiently large

or sufficiently small to express the ratio of the two.

When we consider a variable quantity as increasing by infinitely small degrees, if we wish to know the value of those increments, the most natural mode is to determine the value of this quantity for any given period, as a second of time, and the value of the same for the period immediately following. This difference is called the differential of the quantity. The integral calculus, as has been already stated, is the reverse of the differential calculus. There is no variable quantity expressed algebraically, of which we cannot find the differential; but there are differential quantities which we cannot integrate: some because they could not have resulted from differentiation; others because means have not yet been discovered of integrating them. Newton was the first discoverer of the principles of the infinitesimal calculus, having pointed them out in a treatise written before 1669, but not published till many years after. Leibnitz, meanwhile, made the same discovery, and published it before Newton, with a much better notation, which is now universally adopted.

CALCUTTA, a city of Hindustan, capital of the presidency of Bengal, until 1912 capital of the British dominions in the East and seat of the supreme government, on the Hooghly river, an arm of the Ganges, about 100 miles N. of the Bay of Bengal. On approaching the city from the sea, it presents a magnificent appearance, with its elegant villas on each side of the river, the government botanical gardens, its numerous spires of churches and temples, and the strong and regular citadel of Fort William. This city extends along the bank of the Ganges for 6 miles, and has an average breadth of 2 miles. A handsome quay, the Strand, about 40 feet above low-water mark, embanks the river for about 3 miles, and is furnished with about 30 principal ghauts, or landing-places. The river here is about a mile in width, and is crowded with shipping. The European residents live mostly in the Chowringhee suburb of the city, and at Garden Reach, in beautiful and detached villas. The citadel, or Fort William, is not only the strongest and most complete fortress in India, but also in the British dominions. Calcutta is popularly denominated the "City of Palaces," and this is not an overdrawn appellation. It is certainly replete with magnificent buildings, but, nevertheless, like all Eastern cities, it contains quarters, inhabited by the native people, which are dingy-looking and

mean. Among the principal public edifices are the Government House, Mint, Custom House, the Scotch, Portuguese, Greek, and American churches, the Courts of Justice, colleges, hospitals, etc. The environs of the city are very attractive, and its market is admirably supplied with the choicest game, fruits, etc. European society here is gay and convivial; but a certain degree of formality prevails, and the Brahminical institution of "caste" would appear to have communicated itself to all the ranks and classes of Europeans. Pop., including Howrah and suburbs, about 1,300,000.

CALDECOTT, RANDOLPH, an English artist; born in Chester, England, March 22, 1846. In 1882 he became a member of the Institute of Painters in Water-colors. He will chiefly be remembered by the admirable "Caldecott's Picture-books," which began in 1878, with "John Gilpin" and "The House that Jack Built." After vain attempts to restore his health by trips abroad, he died in St. Augustine, Fla., Feb. 12, 1886.

CALDER, WILLIAM M., an American senator, born in Brooklyn, N. Y., in 1869. He was elected in 1904 to represent the 6th New York district in the 59th Congress; was re-elected to the four succeeding Congresses. He was chosen delegate to the Republican National Conventions of 1908, 1912 and 1916. In 1916 he was elected United States Senator for the term beginning March 4, 1917.

CALDERON DE LA BARCA, PEDRO (dā lä bär'kä), a Spanish dramatist; born in Madrid, Spain, Jan. 17, 1600; educated in the Jesuits' College, Madrid, and at Salamanca. Before his 14th year he had written his third play. Leaving Salamanca in 1625, he entered the army and served with distinction for 10 years in Milan and the Netherlands. In 1636 he was recalled by Philip IV., who gave him the direction of the court entertainments. The next year he was made knight of the order of Santiago, and served in 1640 in the campaign in Catalonia. In 1651 he entered the clerical profession, and in 1653 obtained a chaplain's office in the archiepiscopal church at Toledo. But as this situation removed him too far from court, he received, in 1663, another at the king's court chapel; and at the same time a pension was assigned him from the Sicilian revenue. His fame greatly increased his income, as he was solicited by the principal cities of Spain to compose their "Sacremental Acts," for

which he was liberally paid, and on which he specially prided himself. Besides heroic comedies and historical plays, some of which merit the name of tragedies, Calderon left 95 sacramental acts, 200 preludes, and 100 farces. He wrote his last play in the 80th year of his age. His smaller poems are now forgotten, but his plays have maintained their place on the stage even more than those of Lope de Vega. Their number amounts to 127. He wrote, however, many more, some of which were never published. He died in Madrid, May 25, 1681.

CALEDONIA, the name given by the Romans to that part of Scotland which lay between the Friths of Forth and Clyde, and which was partially inhabited by the tribe of Caledonii. The name Caledonii disappears about the beginning of the 4th century, when the inhabitants of Scotland begin to be spoken of as Scots and Picts. The word Caledonia has been retained as a kind of poetical name for Scotland.

CALEDONIAN CANAL, a chain of natural lakes united by artificial canals, running straight across the N. of Scotland in a S. W. line from the North Sea to the Atlantic, through Glenmore, or the Great Glen of Albin, in Inverness-shire, and touching Argyllshire at its extremity.

CALENDAR, a distribution or division of time into periods adapted to the purposes of civil life; also a table or register of such divisions, exhibiting the order in which the seasons, months, festivals, and holidays succeed each other in the year. The most remarkable calendars are:

1. The Hebrew calendar. The year of the Jews was a lunar one, being composed of 354 days, divided into 12 months, which had alternately 29 and 30 days. In order to make this lunar year accord with the solar year, the Hebrews supplied, seven times in 19 years, an intercalary month of 29 days. Each month was divided into periods of seven days, or weeks, the Saturday being celebrated under the name of Sabbath.

2. The calendar of the Greeks, whose year was likewise lunar, and composed of 12 months, containing alternately 29 and 30 days. To accommodate this year to the solar one, the Greeks added every two years a supplementary month. Each month was divided into three decades.

3. The Roman, or Julian calendar. The Roman year, under Romulus, contained only 10 months, or 304 days. Under

Numa, however, the year was extended to 12 months, or 355 days; but, although nominally thus defined, the calendar did not in reality fix anything more precise than the commencement of the months and seasons; and through the ignorance or negligence of the priests, the utmost derangement subsequently arose. To obviate this condition, Julius Caesar, in 46 B. C., effected a reform, by the introduction of the Julian calendar, in which the length of the solar year was fixed at 365 days, to which was added, every four years, a day called *bissextilē*. This calendar was adopted not only by the Romans, but also by all the modern nations, and remained in use until the introduction of the calendar of Gregory XIII. The Roman year had 12 months, each being divided into unequal parts by the Calends, Nones, and Ides.

4. The Gregorian calendar. This mode of distributing time was the result of the reform inaugurated by Gregory XIII. It came into operation in October, 1582. The Greeks and Russians have refused to adopt the Gregorian calendar, retaining the old style, or Julian calendar. Hence it is necessary to deduct 12 days from the new style in order to make it agree with the old.

5. The Ecclesiastical calendar. The adaptation of the civil to the solar year is attended with no difficulty; but the church calendar, for regulating the movable feasts, imposes conditions less easily satisfied. The early Christians borrowed a portion of their ritual from the Jews. The Jewish year was luni-solar; that is to say, depended on the moon as well as on the sun. Easter, the principal Christian festival, in imitation of the Jewish passover, was celebrated about the time of the full moon. Differences of opinion, and consequently disputations, soon arose as to the proper day on which the celebration should be held. In order to put an end to an unseemly contention, the Council of Nice laid down a specific rule, and ordered that Easter should always be celebrated on the Sunday which immediately follows the full moon that happens upon, or next after, the day of the vernal equinox. In order to determine Easter, according to this rule, for any particular year, it is necessary to reconcile three periods, namely, the week, the lunar month, and the lunar year. To find the day of the week on which any given day of the year falls, it is necessary to know on what day of the week the year began. In the Julian calendar this was easily found by means of a short period or cycle of 28 years, after which the year begins with the same day of the week. In the Gregorian calendar

this order is interrupted by the omission of the intercalation in the last year of the century. The connection of the lunar month with the solar year is an ancient problem for the resolution of which the Greeks invented cycles and periods, which remained in use with some modifications till the time of the Gregorian reformation. The author of the Gregorian calendar, Luigi Lilio Ghiraldi, or, as he is frequently called, Aloysius Lilius, employed for the same purpose a set of numbers called *epacts*.

6. New French calendar. A new reform of the calendar was attempted to be introduced in France during the period of the first revolution. This was adopted by a decree of the National Convention of October, 1793. The year was therein divided into 12 months, of 30 days each, 5 complementary, or "sansculottides" days, being added at the end of each year. The commencement of the year was fixed at midnight of September 22d (the autumnal equinox), and retrospectively, the new year, or Year I. of the Republic, began on Sept. 22, 1792. Fresh names were given to the months and the days, the titles of the months being, for the autumn season, Vendémiaire, Brumaire, and Frimaire; for the winter season, Nivôse, Pluviôse, and Ventôse; for the spring season, Germinal, Floréal, and Prairial; and for the summer season, Messidor, Thermidor, and Fructidor: these names having reference to agricultural labors, or the state of nature in the different seasons of the year. Each month was divided into three decades (10 days each), each day bearing, instead of the name of a saint, that of an agricultural product, implement, or animal useful in cultivating the earth. This calendar remained in force during 13 years, and was abolished by decree of Napoleon I., on Jan. 1, 1806.

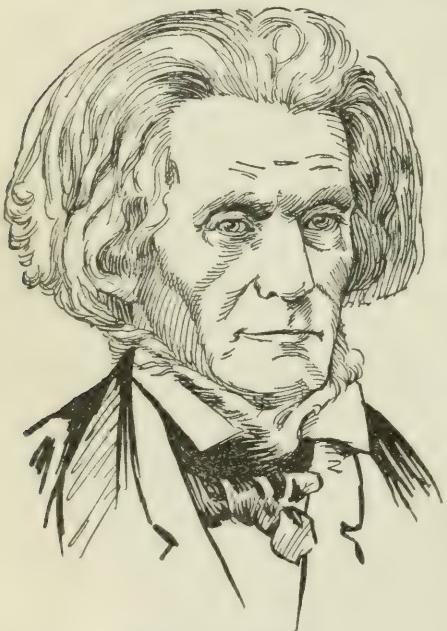
CALENDS, the first day of the month among the Romans. **THE GREEK CALENDAS**, a time that never occurred; an ancient Roman phrase which originated in the fact that the Greeks had nothing corresponding to the Roman calends.

CALENDULA, a genus of plants, of which *C. officinalis*, the Garden Marigold, is a species. They are showy plants, and are in some places used in cookery.

CALGARY (kal'ga-ri), a city in the Province of Alberta, Canada, with station on the Canadian Pacific Railway, 2,262 miles W. of Montreal. It stands 3,380 feet above sea-level, in a broad and level valley between the Bow and Elbow rivers, and is a trading center for a wide district, much of which is taken up by cattle ranches. It is the

seat of the University of Calgary and of Mount Royal College (Methodist), and has numerous other educational institutions, churches, banks, etc. It is important as a milling center and its industrial establishments have greatly grown in recent years both in numbers and in importance, including now brick-yards, cement mills, iron and metal works, packing houses, etc. Coal, lime, clay, and building stone are abundant in the vicinity. It dates from 1884. Pop. about 70,000.

CALHOUN, JOHN CALDWELL, an American statesman; born in Abbeville district, S. C., March 18, 1782; graduated with distinction at Yale College, in 1804, and was admitted to the South Carolina bar in 1807. After serving for two sessions in the Legislature of his native State, he was elected to Congress in 1811. From that time until his death, a period of nearly 40 years, he was seldom absent from Washington, being



JOHN C. CALHOUN

nearly the whole time in the public service, either in Congress or in the Cabinet. When he first entered Congress, the difficulties with England were fast approaching actual hostilities, and he immediately took part with that section—the Young Democracy, as they were termed—of the dominant party, whose object it was to drive the still reluctant

administration into a declaration of war. They succeeded, and, as a member of the Committee on Foreign Relations, he reported a bill for declaring war, which was passed in June, 1812. When Monroe formed his administration, in 1817, Calhoun became Secretary of War.

In 1824, he was chosen Vice-President of the United States under John Q. Adams, and again, in 1828, under General Jackson. With the latter, he did not long continue on amicable political relations, but entered into fierce opposition, when the President, and a majority of Congress, determined to enforce submission to the law of 1828, imposing a heavy protective tariff. It was at this period that he broached his famous "Nullification Doctrine," which is, substantially, that the United States is not a union of the people, but a league or compact between sovereign States, any of which has a right to judge when the compact is broken, and to pronounce any law to be null and void which violates its conditions. In short, Calhoun was the first great advocate of the doctrine of Secession. Hence his advocacy of the extreme doctrine of State-Rights; his censure of the Missouri Compromise, passed 13 years before, when he was himself in the Cabinet; his support of all measures tending to the extension of slave-holding territory; and, finally, his proposal to amend the Constitution by abolishing the single office of the presidency, and creating two presidents, one for the North, and the other for the South, to be in office at the same time. The place in which he advocated these doctrines was his own favorite arena—the floor of the United States Senate, where he continued for the rest of his life, except for a short time at the close of Mr. Tyler's administration, when he accepted the office of Secretary of State, in order to complete a favorite measure—the annexation of Texas. He died in Washington, March 31, 1850.

CALICO (so called because brought to Europe at first from Calicut, on the Malabar coast), cotton cloths having colored patterns printed on them. These cloths are coarser than muslin.

CALICUT, a seaport of India, in the presidency of Madras, on the Malabar coast, which was ceded to the British in 1792. It was the first port in India visited by Europeans, the Portuguese adventurer, Pedro da Covilham, having landed here about 1486, and Vasco da Gama in 1498. It has considerable export trade in timber and spices, and manufactures cotton cloth, to which it has given the name calico. Pop. about 80,000.

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CALIFORNIA, a State in the Western Division of the North American Union, bounded by Oregon, Nevada, Arizona, Lower California, and the Pacific Ocean; land area, 155,980 square miles; admitted to the Union Sept. 9, 1850; number of counties, 58; pop. (1890) 1,208,130; (1900) 1,486,053; (1910) 2,577,549; (1920) 3,426,861; capital, Sacramento.

Topography.—The surface of the State is very mountainous, being traversed by two ranges extending in a N. W. and S. E. direction. The Coast Range, consisting of a number of broken ridges, has an average width at the base of 65 miles, and varies from 1,000 to 8,000 feet in height. The highest peaks are Mt. Ripley, 7,500 feet, and Mt. Downie, 5,675 feet. The Sierra Nevada Mountains join the Coast Range and extend along the E. border of the State for about 450 miles, with nearly 100 peaks exceeding 10,000 feet in height, the highest being Mt. Whitney, 14,898 feet, Mt. Tyndall, 14,386 feet, and Mt. Shasta, 14,350 feet. Between these ranges is a basin, at some early time the bed of a lake, about 450 miles in length, the N. section known as the Sacramento Valley, and the S. section as the San Joaquin Valley. This valley contains Tulare Lake, and is drained by the Sacramento and San Joaquin rivers. The coast line is irregular, with numerous capes and bays, affording many good harbors. San Francisco Bay is the largest and best harbor on the Pacific coast.

Geology.—The mountainous parts of California consist almost entirely of volcanic rocks, with many extinct craters. Tertiary and cretaceous sandstones are found in the foothills and along the coast range, while the central mass of the Sierras and their highest peaks are of granite. Metamorphic formations are found in the N. W., and extend along the Sierra and San Bernardino mountains and the detached triassic and jurassic fields bordering the Sierras are known as the auriferous, or gold belt.

Mineralogy.—California was for many years the first State in the Union in the production of gold, but it has now dropped to second place. As early as 1841 gold was obtained by washing near the San Fernando Mission. In 1848, the discovery at Coloma of large gold deposits started the up-building of California. At first mining was carried on by washing the river gravel, and in 1851 sluices were built through which the water was passed. These sluices were filled with blocks of wood or stones, which collected the gold as it sank. Digging was carried on also, and in 1852 a hydraulic system was introduced, by

which great streams of water were turned against the gravel banks. This process was successful, but by it the banks were rapidly swept away and the detritus threatened to choke the rivers, so that its use was soon prohibited by law. Gold is found in the metallic state, often associated with silver and other metals, on the slopes of the Sierras. It is also found in streams and alluvial deposits in coarse grains, and quartz deposits where it is extracted by amalgamation. A very rich quality of silver occurs in small quantities, and magnetic iron and cinnabar abound in the Sierras. Pyrites of iron and copper are found in gold-bearing quartz, and a rich variety of argentiferous galena occurs in San Bernardino county. Other valuable mineral products are: tin, plumbago, cobalt, granites, marbles, sandstones, hydraulic limestones and bituminous coal.

Mineral Production.—The combined output of gold, silver, copper, zinc, and lead mines for 1918 was valued at \$32,223,500. The iron ore output was 25,000 gross tons. The yield of silver was 1,533,000 ounces, of copper 48,538,000 pounds, of lead 14,655,800 pounds, and of zinc 4,697,900 pounds. The gold production was valued at \$16,528,953. The estimate for 1919 was of gold \$17,320,250, silver \$1,244,386, copper \$4,236,934, lead \$253,944, and zinc \$68,533. The most notable development in the mineral production of California has been the extraordinary increase in the production of petroleum. The production in 1899 reached scarcely 2,000,000 barrels. This has increased in 1906 to 34,500,000 barrels, in 1914 to 86,450,797 barrels, and in 1918 to 97,531,997 barrels. In the production of petroleum California was exceeded in 1918 only by Oklahoma. The total value of the production of 1918 was \$118,770,790. This development resulted from the discovery of oil-bearing fields in various parts of the State.

Soil.—The soil varies with the surface conditions of the State. In the elevated portions it is rich, mellow, and easily worked, and timber land abounds. In the lower portions the soil varies from a rich loam to a heavy clay or adobe. What was formerly considered desert land can now, under irrigation, be turned into valuable agricultural districts.

Agriculture.—The State is very rich in its agricultural interests. The acreage, production and value of the principal crops in 1919 was as follows: corn, 87,000 acres, with a production of 2,871,000 bushels, valued at \$5,139,000; oats, 175,000 acres, with a production of 5,250,000 bushels, valued at

\$5,040,000; wheat, 990,000 acres, with a production of 16,335,000 bushels, valued at \$33,323,000; barley, 1,000,000 acres, with a production of 30,000,000 bushels, valued at \$42,300,000; hay, 2,352,000 acres, with a production of 4,257,000 tons, valued at \$73,220,000; beans, 395,000 acres, with a production of 4,464,000 bushels, valued at \$19,418,000; potatoes, 88,000 acres, with a production of 11,352,000 bushels, valued at \$19,412,000; cotton, 167,000 acres, with a production of 102,000 bales, valued at \$21,930,000; rice, 142,000 acres, with a production of 7,881,000 bushels, valued at \$21,042,000; and hops, 11,000 acres, with a production of 17,875,000 pounds, valued at \$13,764,000. There were, in 1919, 88,197 farms, with a total acreage of 27,931,000, valued at \$1,614,694,000.

Manufacturing.—In 1914 there were nearly 5,000 manufacturing industries. There were 10,057 establishments, 176,547 workers engaged, with salaries and wages of \$140,842,691. The capital invested was \$736,105,455, and the value of the manufactured products was \$712,800,764. The chief industries were meat packing, fruit and vegetable canning, lumber, foundry, and machine-shop products, flour and mill products, petroleum, and shipbuilding.

Banking.—In 1919 there were 290 National banks in operation, having \$62,976,000 in capital, \$22,017,000 in outstanding circulation, and \$126,244,000 in United States bonds. There were also 298 State banks, with \$34,391,000 in capital, \$253,301,000 in deposits, and \$342,137,000 in resources. In the year ending Sept. 30, 1919, the exchange at the United States clearing houses in San Francisco aggregated \$6,703,134,000.

Education.—The public school enrollment in 1918 was 596,155. There were 11,680 teachers in the elementary schools, and 2,882 in the high schools. The average salary of male teachers in the elementary schools was \$905; female \$895; in the high schools \$1,450.64 for male teachers and \$1,336.95 for female. The annual expenditure for schools is \$34,133,122. There are 13 colleges with an enrollment of 15,136. The principal universities and colleges are: University of California (opened 1869, non-sectarian); Leland Stanford Junior University (1891, non-sectarian); St. Ignatius College (1855, Roman Catholic); Santa Clara College (1851, Roman Catholic), and the University of Southern California (1880, Methodist Episcopal). See LELAND STANFORD JUNIOR UNIVERSITY; CALIFORNIA, UNIVERSITY OF.

Charities.—State institutions on Nov. 30, 1919, held 15,169 inmates, distrib-

uted as follows: State reform schools, 734; hospitals for the insane, 10,124; Industrial Home for Adult Blind, 139; Home for Feeble-minded, 1,301. There were 2,871 in the State prisons.

Railroads.—There are 12,145 miles of railway and 3,032 miles of electric railways in the State. California has 19 lines of ocean steamers plying to China, the Philippines, Chile, Panama, Mexico, and Alaska. There are also 13 coastwise lines.

Finances.—The revenues for the fiscal year 1918-1919 were \$50,132,906.37, and the expenditures \$50,681,433.48. On July 1, 1919, the net bonded debt was \$44,138,500. The assessed valuation of taxable property was \$4,023,009,588.

State Government.—The Governor is elected for a term of four years and receives a salary of \$10,000 per annum. The legislature has 40 members in the Senate and 80 in the House. There are eleven Representatives in Congress. The State government in 1920 was Republican.

History.—The name California was applied to an island in the Pacific in 1521, and, sometime between 1535 and 1549, was also applied to that part of North America now known as California and Lower California. Several Spanish and English explorers visited this section during the 16th and 17th centuries, and in 1769 the Franciscan monks founded San Diego and soon afterward many other missions, including Dolores at San Francisco, 1776. In 1826 the first American emigrant train entered the present limits of the State, and in 1849 Monterey was made the capital. The United States tried to form an alliance with California in 1846; but the Americans already settled there seized Sonoma and proclaimed a republic. At the outbreak of the Mexican War, San Francisco was seized by the Americans, and, on Aug. 15, 1846, California was declared United States territory. In 1848 gold was discovered, and this led to a great immigration. In less than four years there were 250,000 people in the State. Many of these were lawless and capable of any crime, and several times vigilance committees were organized by the better class for active measures in the suppression of crime. California was admitted to the Union as a Free State, Sept. 9, 1850. In 1869 the Central Pacific Railroad was completed, and the employment of Chinese in this work led to serious riots, and resulted in the passage by Congress of the Chinese Exclusion Act. During the Spanish-American War and the American operations against the Filipino insurgents, nearly all the expeditions to the Philip-

pine Islands started from San Francisco. Agitation against the immigration of Japanese laborers, which became acute in 1912 and the year following, and which was quieted by a compromise between the American and Japanese Governments, again became a source of irritation in 1920. The action of the United States Government in practically debarring Japanese immigrants from California was bitterly resented by the Japanese people.

CALIFORNIA, GULF OF, or SEA OF COTES, an arm of the Pacific Ocean, separating Lower California from the Mexican mainland. It is 700 miles in length and varies in width from 40 to 100 miles. There is but little navigation carried on there. On the W. coast are pearl fisheries. The gulf was discovered by Cortes, and for some time was called after him. The river Colorado empties into the N. extremity. The principal ports are San Felipe, San José, and La Paz on the W. shore, and Mazatlán, and Guaymas on the E. shore.

CALIFORNIA, LOWER, a territory of Mexico, comprising a peninsula jutting into the Pacific Ocean, and separated from the mainland throughout its entire length by the Gulf of California. It is nearly 800 miles in length, and from 30 to 120 miles wide; area 58,328 square miles. It is largely mountainous and arid, but possesses valuable agricultural and mineral resources. The chief towns are Ensenada de Todos, Santos, and La Faz, the capital. Pop. about 55,000, of whom perhaps a half are Indians.

CALIFORNIA, UNIVERSITY OF, a non-sectarian coeducational seat of learning in Berkeley, Cal. The undergraduate department is located at Berkeley, 9 miles from San Francisco; the astronomical department and Lick Observatory at Hamilton, Santa Clara co., and the professional schools at San Francisco. Tuition is free. The principal benefactor of the university, from 1896, was Mrs. Phoebe A. Hearst, widow of Senator Hearst. Her gifts reach millions of dollars. As a result of these and other resources of endowment, the institution has become one of the richest of American universities.

In the fall of 1919 there were 5,276 men and 4,002 women enrolled as students. The teaching staff had 696 members. There were 458,000 bound volumes and 185,000 pamphlets in the library. David P. Barrows, Ph. D., professor of Political Science at the university, was elected President of the institution, to fill the vacancy created by the resignation of Dr. Benjamin Ide Wheeler in June, 1919.

CALIGULA, CAIUS CÆSAR AUGUSTUS GERMANICUS (ka-lig'ü-lä), a Roman emperor, son of Germanicus and Agrippina; born A. D. 12, in the camp at Antium. He received from the soldiers the surname of Caligula, on account of his wearing the *caligæ*, a kind of boots in use among them. He succeeded Tiberius, 37 A. D., and made himself very popular by his mildness and ostentatious generosity; but at the end of eight



CALIGULA.

months he was seized with a disorder, caused by his irregular mode of living, which appears to have permanently deranged his intellect. After his recovery, he suddenly showed himself the most cruel and unnatural of tyrants. He was assassinated by a band of conspirators 41 A. D.

CALIPH, CALIF, or KHALIF, the title borne by the successor of Mohammed in temporal and religious authority.

The First Four Caliphs.—The Prophet leaving no son, the wise and good Abu-bekr, father of his favorite wife Ayeshah, was elected by an assembly of the faithful (632 A. D.). On Omar's death (644) a council of six appointed as third caliph Othman, the Prophet's secretary and son-in-law. Othman was succeeded by the heroic Ali, poet, soldier, and saint, husband of Fátima, and son of the Prophet's uncle Abu Taleb. Moawiyah, governor of Syria, son of that Abu Sufián, who as Mohammed's enemy had been beaten at Bedr, and had helped to beat him at Ohud, claimed to succeed his cousin Othman. On Ali's murder by a fanatic he negotiated the abdication of Ali's son, Hassan, and becoming caliph in "the year of union," 661, made the title hereditary.

The Ommiades.—Moawiyah (661-679) was the first caliph of the line called Ommiades, from one of his forefathers. Their seat was Damascus.

Moawiyah was a statesman; the rest of his line were neither statesmen nor saints. His son Yezid I. (679-683) succeeded him.

Yezid I. was followed by Moawiyah II. (683); and he by Merwân I. (murdered 685). Abdalmâlik's troubled reign lasted till 705.

The glorious reign of the inactive Walid I. (705-715) saw the caliphate extended at one end by the addition of Spain, and at the other end Sogdiana, between the Oxus, the Jaxartes, and the Caspian Sea, taken from the Turks by Kuteibah, and the caliphate extended to the mouth of the Indus. Suleimân I. (died 717) sent a magnificent army and fleet under his brother Môslemah against Constantinople; but next year (718) both perished almost utterly. Good Omar II.'s reign was ended with poison (720). Yezid II. died 724. Hishâm died 743. Walid II. was killed in an insurrection (744). Yezid III. died 744. Ibrahim was dethroned by Merwân II., governor of Armenia (745).

The Abbassides.—The first Ommiade united the caliphate; the first Abbasside divided it. One Ommiade, Abdurrahman, escaped from the massacre of Abdallah, and, crossing the strait into Spain, founded after a struggle the Ommiade caliphate of Spain of Cordova.

Abûl Abbas (750-754), called also Saffah, "the shedder" of his enemies' blood, was followed by his brother Abu Jafar Almansôr (754-775), who founded Bagdad for the seat of empire. The £30,000,000 sterling left by him, his son Almahdi (775-785) and grandson Alhâdi (785-786) vaingloriously squandered. Alhâdi's brother, Harûn Ar Rashid, "The Just" (Haroun Al Raschîd) (786-809), owes his fame to the interested praise of orthodox and literary men. His three sons, instead of accepting his partition of the empire, fought for supremacy. Almin, the caliph, was defeated and slain (813); Almamûn, his brother (813-833), aided the culmination of Saracen culture.

Mutassem (833-842), following his brother, maintained the desolating indecisive wars in Asia Minor. With him departed the glory of the Abbassides. Sectarian persecution was the bane of Alwâthek's reign (842-847) and Mutawakkil's (847-861). His son, Mûntasir, conspired with the Turks against him and slew him, and reigned 861-862. Almustain reigned 862-870; Almûhtadi, 870-871; Almûtâmid, 871-893; Almûtâhid, 893-903; Almûktâfi, 903-908; Al-

mûktadir, 908-932; Kahir, 932-934; Radhi, 934-940, was the last caliph that like a true Imâm and caliph preached to the people. Mutakki died 944; Mustakfi, his successor, had no temporal power beyond the walls of Bagdad.

Ommiades of Spain.—Abdurrahman I. (755-787), on accepting the Spanish throne which was offered him by the Arab chiefs, assumed the titles of *Caliph* and *Emir-ul-Muminîn*. He built (786) the great mosque of Cordova, now the cathedral. His successors, Hashem I. (787-796) and Al-Hakem I. (796-821), were much troubled with internal revolts. Abdurrahman II. (821-852) re-established internal quiet, and occupied his subjects with incessant wars against the Christians. These conflicts developed among the Arabs that chivalrous heroism which is found nowhere else in the Mohammedan world. Abdurrahman, himself a man of learning, greatly encouraged the arts and sciences, and diffused information among his people; he also attempted, by regulating the laws of succession to property, to constitute his kingdom on a basis analogous to that of other European nations. During his reign Mohammedan Spain was the best-governed country in Europe. His successors, Mohammed I. (852-880), Mondhâr (880-882), and Abdallah (882-912), followed in his footsteps. Abdurrahman III. (912-961), like his predecessors, was a great encourager of learning, and a poet of no mean ability. He founded schools which far surpassed those in other parts of Europe. His son, Al-Hakem II. (961-976) was in every way worthy to be his successor, but his premature death was the cause of the downfall of the Ommiades in Spain. Hashem II. (976-about 1013), a child of eight years, now occupied the throne; but fortunately his mother, Sobeïha, possessed the abilities necessary for such an emergency, and appointed as her son's vizier Mohammed ben Abdallah, surnamed Almansôr, "the victorious," who had originally been a peasant. Hashem finally, after having been supposed dead for several years, resigned the throne about 1013; and, with the exception of the brief reign of Hashem III. (1027-1031), from this time the family of Omeyyah, which had for more than two centuries so happily and brilliantly governed the greater part of Spain, disappears from history.

CALISAYA BARK, a variety of Peruvian or cinchona bark, namely, that of *Cinchona calisaya* or *flava*.

CALISTHENICS, or **CALLISTHENICS**, a name for exercises for promoting gracefulness and strength, and compris-

ing the more gentle forms of gymnastics, especially for girls.

CALIXTINES (ka-liks'tins), a Christian sect in Bohemia, the more moderate of the two great sections into which the Hussites were divided in 1420.

CALIXTUS, the name of several popes:

CALIXTUS I., Roman bishop in 217; succeeded Zephyrinus in 219; suffered martyrdom in 223.

CALIXTUS II., son of Count William of Burgundy, archbishop of Vienna, and papal legate in France; was elected in 1119 in the monastery of Clugny, successor of the expelled pope, Gelasius II. He made his entrance into Italy in 1120, and, with great pomp, into Rome itself; took Gregory VIII. prisoner in 1121 by the aid of the Normans, and availed himself of the troubles of the emperor to force him, in 1122, to agree to the Concordat of Worms. He died in 1124.

CALIXTUS III., the title under which Alfonso Borgia, a Spanish nobleman and counsellor of Alfonso, king of Aragon and the Sicilies, was made pope in 1455. In order to appease the displeasure occasioned by the proceedings of the councils of Constance and Basel, he instigated a crusade against the Turks. He died in 1458.

CALLA, a genus of plants of the order of Araceæ. The species are perennials. They are natives of North America and northern Europe. They are herbaceous marsh plants. The most familiar of the species is the beautiful calla lily.

CALLAO (käl-lä'ō), the port of Lima, Peru, lies 7 miles S. W. of Lima by rail, on a small bay. The streets generally are narrow and the buildings unimportant. The town possesses a floating dock, and fine harbor works, embracing an area of 520 acres, with extensive pier and dock accommodation; and the spacious roadstead, sheltered by the island of San Lorenzo, is one of the safest in the world. The huge old Spanish fortress is used for custom-house offices. There are sugar refineries, ironworks, and sawmills; but the place depends chiefly for its prosperity on its trade. The exports are wool, sugar, specie, copper, cotton, bark, hides, guano, and cubic niter. The present Callao dates only from 1746, when the original city, a short distance to the S., was destroyed by an earthquake and an invasion of the sea. Callao was bombarded in 1880 during the war between Chile and Peru, and the annexation by the former of the guano-producing islands materially decreased the exports of this manure; crude niter (a government monopoly)

and wool come next in importance. By the completion of a direct cable between this port and Mollendo, telegraphic communication has been established with the United States. Pop. about 35,000.

CALLIMACHUS (ka-lim'ä-kus), a Greek poet; born in Cyrene; flourished in the 3d century B. C. He wrote epics called "Hecale" and "Galatea," besides tragedies, comedies, elegies, and hymns; but only some epigrams, sacred songs, and verses have come down to us, among which are a "Hymn to Jupiter," an "Epitaph on Heracleitus," and one on himself.

CALLINUS (ka-lē'nus), of Ephesus, the earliest Greek elegiac poet, flourished about 730 B. C. Only a few fragments of his elegies are extant.

CALLIOPE (ka-lī'ō-pē), one of the Muses. She presided over eloquence and heroic poetry, and is said to have been the mother of Orpheus by Apollo.

CALLIOPE, an asteroid, the 22d found. It was discovered by Hind, on Nov. 16, 1852. Also a series of steam whistles, pitched to produce musical notes, grouped together and operated by a keyboard. The instrument is much in use in traveling circuses of the United States.

CALLISTHENES (kal-is'the-nēz), a Greek philosopher, born in 365 B. C. He was a disciple and grandson of Aristotle, and accompanied Alexander the Great in his expedition to Asia. He refused to acknowledge the alleged divinity of this hero, and even had the misfortune to displease him by his railleries. He was afterward accused of conspiracy, and put to death 328 B. C.

CALLISTO, in classical mythology, an Arcadian nymph. Zeus's love for her aroused the jealousy of Hera, who induced Artemis to put Callisto to death. Subsequently Zeus transformed Callisto into the constellation Arctos or the Bear.

CALLISTRATUS (ka-lis'tra-tus), an Athenian orator, whose eloquence is said to have fired the imagination of the youthful Demosthenes. For his Spartan sympathies he was condemned to death by the Athenians in 361, and on his return from exile in Macedonia was actually executed.

CALLOSITY, any thickened or hardened part of the human skin caused by pressure and friction. Also the natural cutaneous thickenings on the buttocks of monkeys.

CALLOT, JACQUES (kä-lö'), a French engraver; born about 1593; distin-

guished himself in Italy and France, and was patronized by the Grand Duke of Tuscany and by Louis XIII. He preferred etching, probably because his active and fertile genius could in that way express itself more rapidly. In the space of 20 years he designed and executed about 1,600 pieces, the characteristics of which are freedom, variety, and naïveté. He died in 1635.

CALMAR, a fortified seaport town of Sweden, on the W. side of a narrow strait of the Baltic, separating the island of Öland from the continent, 50 miles N. E. by E. of Karlskrona. The town, built of wood, stands on the small island of Quarnholm; its harbor is small but safe and commodious. Tar, alum, hemp, and timber are extensively exported. Here, in 1397, was concluded the famous treaty which united the kingdoms of Sweden, Denmark, and Norway under the rigorous scepter of Queen Margaret. Here also, in 1520, Gustavus Vasa disembarked to deliver his country from the domination of foreigners and of a sanguinary tyrant. Pop. about 17,500.

CALMETTE, GASTON, a French journalist, born at Montpellier in 1858. He was the editor of the "Figaro," and was noted as a formidable fighter in the political arena, not fearing to attack his political enemies, and sometimes using methods for that purpose that went beyond the bounds of journalistic ethics. He was engaged in a bitter political contest with JOSEPH CAILLAUX (*q. v.*), Minister of Finance and at one time Premier, and in the course of the controversy secured some private correspondence of Mme. Caillaux, which he was threatening to publish. She learned of his purpose, called upon him, and shot him dead. The tragedy occurred March 16, 1914. The deed was followed by the resignation of Caillaux and by the sensational trial of Mme. Caillaux for murder, of which charge she was declared not guilty.

CALOMEL, mercury sub-chloride, Hg_2Cl_2 . For its preparation see MERCURY. It is insoluble in water, and blacked by ammonia. It is used in liver complaints, and in any of the complaints for which mercury internally administered is indicated. Care should be exercised in its use, as it is likely to induce salivation. It should be tested to see if it contains any mercuric chloride (corrosive sublimate), which is soluble in boiling water. Calomel is a translucent or subtranslucent mineral. It occurs in Germany, Austria, Spain, and other countries.

CALORIC, the name given to a supposed imponderable fluid to which the sensation and phenomena of heat were formerly attributed.

CALORIC ENGINE, the name given by JOHN ERICSSON (*q. v.*) to his hot-air engine.

CALORIE, the metric heat unit; the amount of heat necessary to raise the temperature of 1 gram of water 1° C.

CALORIMETER, an instrument for measuring the quantity of heat which a body parts with or absorbs when its temperature sinks or rises through a certain number of degrees, or when it changes its condition. An ice-calorimeter was invented by Lavoisier and Laplace. It is now superseded by the mercury calorimeter of Favre and Silbermann, which is a very delicate instrument. It is essentially a thermometer with a very large bulb and a capillary tube.

CALPURNIA, the fourth wife of Julius Caesar, married to him 59 B. C. She was a daughter of L. Calpurnius Piso, who was consul in 58 B. C.

CALTHORPE, SIR SOMERSET ARTHUR-GOUGH, a British Admiral; born in 1864. He entered the Royal Navy in 1878 and became a Captain in 1902 and a Vice-Admiral in 1917. He commanded the Second Cruiser Squadron, 1914-1916, and was in charge in the Aegean Sea at the time that Turkey sought an armistice. This was arranged by him to be signed at the island of Mudros, and his was one of the names inscribed on the document.

CALUMET, a kind of pipe for smoking, used by the North American Indians. The bowl is generally of stone, and the stem is ornamented with feathers, etc. The calumet is the emblem of peace and hospitality. To refuse the offer of it is to make a proclamation of enmity or war, and to accept it is a sign of peace and friendship.

CALUMET, a town in Houghton co., Mich.; on the Mineral Range and other railroads; 42 miles N. of L'Anse. It is the seat of the famous Calumet and Hecla copper mine. It is the trade and supply center of the Superior mining district, and has a National bank, several weekly newspapers, manufactories, etc. Pop. (1910) 32,345; (1920) 22,369.

CALVADOS (käl-vä-dö's'), a French department, part of the old province of Normandy, bounded on the N. by the English Channel, and E., W. and S. by the departments Eure, La Manche, and Orne. Area, 2,197 square miles. It is

named from a dangerous ridge of rocks which extends along the coast for 10 or 12 miles. The department is undulating and picturesque, and possesses rich pastures. Chief town, Caen. Pop. about 400,000.

CALVARY, the English designation of the spot upon which the crucifixion of Jesus Christ is recorded as having taken place. It lay beyond but near to the city, and by some is identified with the old House of Stoning, or place of public execution, according to the law of Moses, on the top of the remarkable knoll outside the Damascus gate, on the N. side of Jerusalem. It was from this cliff that the criminal used to be flung before being stoned, and on it his body was afterward crucified; for the spot commands a view all over the city, and from the slopes round it the whole population might easily witness the execution.

CALVÉ, EMMA (käl-vā'), a French opera singer; born in 1866. She made her début at Brussels in Gounod's "Faust." She has made successful tours of the United States in leading rôles. From 1893 to 1904 she was one of the most popular and successful members of the Metropolitan Opera Company. She practically retired from the stage in 1910, appearing, however, still in concerts.

CALVERLEY, CHARLES STUART, an English poet and humorist; born in Martley, Worcestershire, Dec. 22, 1831; he was educated at Oxford and Cambridge. He possessed an exquisite wit. His "Verses and Translations" (1862), have been often reprinted. His "Society Verses" are marked by great elegance and geniality. He died Feb. 17, 1884.

CALVERT, GEORGE. See BALTIMORE (LORD).

CALVIN, JOHN, a reformer and theologian; born in Noyon, Picardy, France, July 10, 1509. Soon after taking a degree, he went to Paris for the study of the humanities. In Paris he came under the influence of the teachers of the new theology, and before long (1534) had to flee from France, seeking refuge at Basel. There he published his greatest work: "Institutes of the Christian Religion" (1536). The year following, he was chosen Professor of Divinity and one of the pastors of the church at Geneva. The strict discipline which he sought to introduce gave rise to ill feelings on the part of the citizens. He was banished from Geneva, and withdrew to Strassburg, where he filled the same posts as in the former city. He was deputed to assist when diets were

held by order of the Emperor Charles V., at Worms and at Ratisbon, for the purpose of composing, if possible, the religious differences which were rending the Roman Church. Bucer accompanied him, and he conferred with Melanchthon and other leaders of the reformers. The



JOHN CALVIN

people of Geneva then besought him to return. Complying with their request, he arrived there Sept. 13, 1541, and straightway established a form of ecclesiastical discipline, and a consistorial jurisdiction with power of inflicting all kinds of canonical punishments, which seemed, to many, a yoke quite as hard to endure as that imposed by Rome. Calvin's inflexible character bore down, however, all opposition, and so sternly and rigorously did he carry out his own rules that he condemned to the stake and caused to be burned his once intimate friend, Michael Servetus, for writing against the doctrine of the Trinity. Calvin (whose real name was Chauvin, which, after the custom of that age, he Latinized into Calvinus) died in Geneva, May 27, 1564.

CALVINISM, the tenets of John Calvin. Sometimes the term Calvinism comprehends his views regarding both theological doctrine and ecclesiastical polity; at others it is limited to the former, and especially to his views on the doctrines of grace. These are sometimes called the five points of Calvinism, or, more briefly, the five points; but this latter curt appellation is not sufficiently specific, for the rival system of Armin-

ianism was also presented by the Remonstrants at the Synod of Dort in five points. Those of Calvinism are the following: 1. Original Sin; 2. Total Depravity; 3. Election, or Predestination; 4. Effectual Calling; 5. Final Perseverance of the Saints. Augustine, Bishop of Hippo, who was born in 354, and died in 430, held theological views essentially the same as those afterward promulgated by Calvin. In addition to what may be called the doctrines of grace, Calvin held the spiritual presence of Christ in the Holy Eucharist, but not the doctrine of consubstantiation. He was thus essentially Zwinglian, and not Lutheran.

Calvin's views of church government were essentially what are now called Presbyterian. He held also that the Church should be spiritually independent of the State, but was willing that the discipline of the Church should be carried out by the civil power. This last opinion, followed to its logical conclusion, involved him in heavy responsibility for the death of his Socinian antagonist, Servetus, the capital punishment of whom for alleged heresy was approved of not merely by Calvin, but by the other reformers, not excepting the gentle Melanchthon. No one in those days seems to have clearly understood religious liberty.

CALVINISTIC METHODISTS, a section of the Methodists, distinguished by their Calvinistic sentiments from the ordinary Wesleyans, who are Arminian. Wesley and Whitefield, the colleagues in the great evangelistic movement which did so much spiritually and morally to regenerate England in the 18th century, differed with regard to the doctrines of grace, Wesley being Arminian, and Whitefield Calvinistic; the latter revival preacher may be looked on as the father and founder of Calvinistic Methodism. Other names, and especially that of Howell Harries, of Trevecca, should be mentioned in connection with it. In its distinctive form it dates from 1725, but did not completely sever its connection with the English Church till 1810. In government it is now Presbyterian. Its great seat is Wales.

CALVO, CARLOS, an Argentine author and diplomat, born in Buenos Aires, in 1824. He was a profound student of economic and political problems and stood high as a jurist. In 1860 he was made minister plenipotentiary to the courts of France and Great Britain, and in 1885 was appointed to a similar post in Berlin. He served with distinction and was the recipient of many honors from the nations to which he was

accredited. His studies and writings gave the name to the "Calvo Doctrine," which provided that the collection of pecuniary claims by citizens of one country against those of another should never be collected by force, a doctrine that has been practically acquiesced in by most of the governments of the world. Among his publications are "Historical Annals of the Revolution in Latin America" (1864); "Study on Emigration and Colonization" (1885); "International Law in Theory and Practice" (1872); and "Manual of Public and Private International Law" (1892). He died in Paris in 1906.

CALYPSO, in Grecian legend, was, according to Homer, the daughter of Atlas, and inhabited the solitary wooded isle of Ogygia, far apart from all gods and men. Ulysses being thrown upon her island by shipwreck, she treated him kindly, and promised him immortality if he would marry her.

CALYPTERA, the hood of the theca or capsule of mosses. The same name is given to any hood-like body connected with the organs of fructification in flowering plants.

CALYPTRÆA, a genus of gasteropods, furnished with a patelliform shell, to the cavity of which a smaller conical one adheres, like a cup in a saucer. It is the typical genus of the family Calyptrotridæ. The species are called cup-and-saucer limpets.

CALYX, in botany, the name given to the exterior covering of a flower, that is, the floral envelope consisting of a circle or whorl of leaves external to the corolla, which it incloses and supports. The parts or leaves which belong to it are called sepals; they may be united by their margins, or distinct, and are usually of a green color and of less delicate texture than the corolla. In many flowers, however (especially monocotyledons), there is little or no difference in character between calyx and corolla, in which case the whole gets the name of perianth.

CAM, or **GRANTA**, a sluggish river of England, which, rising in Essex, flows 40 miles N. W. and N. E. through Cambridgeshire, and falls into the Ouse 3½ miles above Ely. It gives name to the town of Cambridge, where it is barely wide enough for an eight-oar to turn.

CAMA, in Indian mythology, the god of love and marriage.

CAMAGÜEY, or **PUERTO PRÍNCIPE**, a province of Cuba which occupies the

east-central part of the island. It has an area of 10,500 square miles. The surface is for the most part a plain with some hilly country in the northern part. The province is heavily wooded and lumbering is the chief occupation. There is also copper mining and cattle-raising. Pop. about 160,000. The capital is Camagüey, which is an old town with numerous churches, a hospital, and other public buildings. The city is connected by rail with its seaport, Nuevitas, and is a station on the Cuban Main Trunk railroad. It has important exports of cattle products. Pop. about 30,000.

CAMARGUE, LA (kä-marg'), the delta of the Rhône, in southern France, department of Bouches-du-Rhône. It is protected from the inundations of the river by dykes, and is mostly an unhealthy tract of pools and marshes, only a small portion of it being cultivated.

CAMARILLA (a little chamber), a word first employed in the time of Ferdinand VII., of Spain (1814-1833), and which now signifies throughout Europe the influence exercised on the State by the court party, the favorites and sycophants of a pope or monarch, in opposition to the advice of his legitimate ministers.

CAMBAY, a feudatory state in India, Bombay presidency, lying at the head of the gulf of the same name in the W. part of Gujarát. Area, 350 square miles; pop. about 80,000. Also, chief town of above state, situated at the head of the Gulf of Cambay, formerly a flourishing port, but now decayed. Pop. about 30,000. The gulf separates the peninsula of Kathiawar from the N. coast of Bombay, having a length of about 80 miles, and an average breadth of 25 miles.

CAMBERWELL, a metropolitan borough of Greater London, on the S. side of the Thames, in the county of Surrey. Pop. (1918) 262,000. See LONDON.

CAMBIER, ERNEST, a Belgian explorer, born in Ath, in 1844. He served for some time in the Belgian army, and in 1877 had the position of geographer with the first expedition of the International African Association. He became the leader of the expedition, when the original commander, Crespel, died at Zanzibar in 1878. After enduring almost unexampled hardships, the expedition reached Unyamwezi and later attained Karemá on Lake Tanganyika. He stayed there for four years, and the valuable researches that he carried on were afterward embodied in his report entitled "Rapports sur les Marches de la Pre-

mière Expédition de l'Association Internationale Africaine." He died in 1909.

CAMBIUM, the viscid substance which appears, in the spring, between the wood and bark of exogenous trees when the new wood is forming, and again disappears as soon as the wood is completely formed. It reappears whenever the plant is again called into growth, as at midsummer, in those species which shoot twice a year.

CAMBODIA, or CAMBOJA, nominally a state in Indo-China under a French protectorate, but practically a French dependency, part of French Indo-China, on the lower course of the Mekong, 220 miles from N. E. to S. W., and 150 miles broad, comprising an area of 46,000 square miles; pop. about 1,650,000. It is bounded on the S. E. and S. by French Cochinchina; on the S. W. by the Gulf of Siam; on the N. by Siam; on the E. by Annam. The coast, 156 miles long, indented about the middle by the Bay of Kompong-Som, offers but one port, Kampot. Among the numerous islands along the coast are Kong, Rong, Hon-Nan-Trung, etc., most of them inhabited. The principal river, the Mekong (in Cambodian, Tonlé-Tom—*i. e.*, "great river"), flows through Cambodia from N. to S. as far as Chen-Tel-Pho, and thence S. W. till, at the town of Pnom-Penh, it divides into two arms, the Han-Giang, or Bassac, and the Tien-Giang, or Anterior river, both flowing S. Above Pnom-Penh is a N. N. W. outlet for the surcharge of the Great river, the Tonlé-Sap (*i. e.*, "river of sweet water"), expanding into the Great Lake, 100 miles by 25 miles in area, with a depth of 65 feet at its maximum magnitude. France, on Aug. 11, 1863, concluded a treaty with the King of Cambodia, Norodom, placing Cambodia under a French protectorate. This treaty was superseded by that of June 17, 1884, under which the King of Cambodia accepted all the reforms, administrative, judiciary, financial, and commercial, which the government of France might institute. At various times since then territorial readjustments were made between Siam and France. The Cambodians approach the Malay and Indian types, are less Mongoloid and more nearly resemble the Caucasian type than their neighbors. Capital, Pnom-Penh. Pop. about 65,000.

CAMBON, JULES MARTIN, a French diplomatist; born in Paris, April 5, 1845. He studied for the law and fought in the Franco-Prussian War, reaching the grade of captain. Entering the civil service, he became prefect of Constantine in 1878, prefect of the Department

du Nord in 1882, prefect of the Rhône in 1887, Governor-General of Algeria in 1891, and Ambassador to the United States from 1897-1902. He represented Spain in drawing up the Spanish-American protocol in 1898. In 1902 he was appointed Ambassador at Madrid, and in 1907 at Berlin. Though he had resigned in December, 1913, he was still Ambassador at Berlin when the World War broke out. He became General Secretary to the Foreign Office in the cabinet of M. Briand. He was a delegate to the Peace Congress in 1919 and served subsequently on many important commissions connected with the carrying out of the treaty terms.

CAMBON, PAUL, a French diplomatist; born in Paris, Jan. 20, 1843. He was graduated at the Ecole Polytechnique in 1863, and, after serving as Secretary to Jules Ferry, became Secretary of Prefecture of the Alpes-Maritimes, Prefect of the Aube, and French Resident-General in Tunis. After serving as Ambassador at Madrid and Constantinople, he was transferred to London in 1898. He played an important part in the formation of the Anglo-French entente. Although he had announced, in 1913, his intention to retire, he served at London throughout the World War.

CAMBRAY, or CAMBRAI, a fortified city of France, in the department of Nord, capital of the arrondissement, on the Scheldt, 32 miles S. S. E. of Lille. Its fortifications were improved by Vauban; the town is well built, and has a magnificent parade ground. Its principal public buildings are the Cathedral, the City Hall, and the Theater, and it has some good schools of art, and a public library. Cambray was formerly an archbishopric, and can boast of having had Fénelon, who died here in 1715, among its prelates. Cambray has long been famous for its manufacture of fine linens and lawns, whence all similar fabrics are called cambrics. It has also manufactures of thread, cottons, soap, leather, linens, etc. It is a very ancient city, having been an important place under the Romans. In 1508 the League of Cambray was concluded here. It was formed by Maximilian I. of Germany, Louis XII. of France, the King of Aragon, Ferdinand of Spain, and Pope Julius, against the Venetian Republic. In 1529 peace between Francis I. and Charles V. was also concluded here. During the WORLD WAR (*q. v.*) Cambray and the territory adjoining saw continuous and severe fighting. In November, 1917, American railway engineers assisted the British and Canadians in driving back a German surprise

attack against Allied positions near Cambrai. Pop. about 25,000.

CAMBRIA, the ancient name of Wales, the *Britannia Secunda* of the Romans. The name is derived from that of Cimbri, or Cymri, by which the Welsh have always called themselves.

CAMBRIAN ROCKS, in geology, an extensive series of gritstones, sandstones, conglomerates, slates, and shales, lying under the Lower Silurian beds, and above the Archæan, and divided into the Upper and Lower Cambrian. Many fossils occur in the series, including sponges, star-fishes, trilobites, brachiopods, lamellibranchs, pteropods, gasteropods, cephalopods, etc. They may be regarded as the bottom rocks of the Silurian system, and are well developed in N. Wales (hence the name), but can be recognized in many other regions.

CAMBRIC, originally the name of a fine kind of linen which was manufactured principally at Cambrai (German *Kambryk*) in French Flanders, whence the name. It is now applied to a cotton fabric, which is very extensively manufactured in imitation of the true cambric, and which is in reality a kind of muslin.

CAMBRIDGE, a city of Maryland, the county-seat of Dorchester co. It is on the Choptank river, and on the Cambridge and Seaford railroad. The city is an important meat-packing center, and has manufactures of underwear and lumber. It is the center of an extensive agricultural district. Pop. (1910) 6,407; (1920) 7,467.

CAMBRIDGE, a city, and one of the county-seats of Middlesex co., Mass., on the Charles river and the Fitchburg railroad; opposite to and connected with Boston by four bridges. It was founded in 1630-1631, under the name of "Newe-Towne," or "Newtown," and did not receive its present name until several years later. In 1636 the General Court appropriated \$2,000 to locate a school in Old Cambridge, which later became Harvard College, now Harvard University. In 1631 Cambridge was 35 miles long and only 1 mile wide, including the townships now incorporated as Billerica, Bedford, Lexington, Arlington, Brighton, and Newton, all of these having been gradually separated from it. The city was formerly divided into villages called Old Cambridge, Cambridgeport, East Cambridge, and North Cambridge, names which are still used. It has grown into a populous manufacturing center, where glass, furniture, organs, steam-engines, etc., are made. Here also is located the

massive stone court house of Middlesex co. The first printing office in the United States was located in Cambridge, and the "Bay Psalm-Book," published by Stephen Day and printed in 1640, was the first book from this press. For historical and literary associations, Cambridge is one of the most famous cities in the United States. The venerable Washington elm, under which Washington took command of the American Army, July 3, 1775, stands at the corner of Mason and Garden streets. "Craigie House," built by Col. John Vassall, in 1759, was Washington's headquarters in 1775-1776, and afterward became the home of the poet Henry W. Longfellow until his death. On Elm avenue is "Elmwood," the birthplace and home of James Russell Lowell, who lived here 1819-1891. A part of this place has been bought by public subscription, to be preserved as a public park. This city has been the home of such distinguished men as Oliver Wendell Holmes, William Henry Channing, Margaret Fuller Ossoli, Col. Thomas Wentworth Higginson, Louis Agassiz, John Fiske, and Charles Eliot Norton. The fine city hall and land for a park was the gift of a former citizen, Frederick H. Rindge, who also presented the city with a public library, an institution now called the Rindge Manual Training School, and other benefactions which amounted to more than \$1,000,000. The beautiful Mount Auburn Cemetery is partly in Cambridge and partly in Watertown. Pop. (1910) 104,839; (1920) 109,694. See HARVARD UNIVERSITY.

CAMBRIDGE, a city of Ohio, the county-seat of Guernsey co. It is on the Baltimore and Ohio and the Pennsylvania railroads. It is the center of an important mining region and is the shipping point for coal and oil. It has tin-plate mills, an earthenware plant, glove factories, and other industries; the division shops of the Pennsylvania railroad; a public library, hospital, and other public buildings. Pop. (1910) 11,327; (1920) 13,104.

CAMBRIDGE, a borough and county-seat of Cambridgeshire, England, and seat of one of the most noted of English universities; on the Cam river; 48 miles N. by E. of London. The greater part of this town is embosomed in the foliage of the gardens of its numerous colleges. The streets are mostly narrow and irregular, houses ancient, and the place is well lighted, paved, and sewered. Of the fine churches here, St. Mary's, St. Sepulchre's, and Trinity are deserving of special mention. Cambridge derives a considerable trade from the agricultural

products of the surrounding country; but its chief prosperity is derived from its university. Pop. about 42,000.

CAMBRIDGESHIRE, a county of England in the inland division. It has an area of about 860 square miles, of which the greater part is meadow and pasture land. The chief rivers are the Ouse, Cam, the Nene, and the Lark. The county-town is Cambridge. Pop. about 200,000.

CAMBRIDGE UNIVERSITY, a celebrated seat of learning and education, dating from certain public schools established in Cambridge in the 7th century. The first college was founded under royal charter in 1237. The number of colleges established are 20, viz.:—Peterhouse, Clare Hall, Pembroke, Caius and Gonville, Trinity Hall, Corpus Christi, King's, Queen's, St. Catharine's, Jesus, Christ's, St. John's, Magdalene, Trinity, Emmanuel, Sidney-Sussex, Downing, and Selwyn. Newnham and Girton Colleges are exclusively for women. The university statutes were confirmed by Victoria on July 31, 1858. Since 1881 women have been admitted on practically the same terms as men. In 1920 the teaching staff numbered 150, and the undergraduates 4,360. The chancellor for 1919-1920 was A. J. Balfour. The university sends two members to Parliament.

CAMBYES, (1) a Persian of noble blood, to whom King Astyages gave his daughter Mandane in marriage. Astyages was dethroned by Cyrus, the offspring of this union. (2) The son of Cyrus the Great and grandson of the preceding, became, after the death of his father, King of the Persians and Medes, 529 B. C. In the fifth year of his reign he invaded Egypt, conquering the whole kingdom within six months. But his expeditions against the Ammonites and Ethiopians having failed, his violent and vindictive nature broke out in cruel treatment of his subjects, his brother Smerdis and his own wife being among his victims. He died in 521 B. C.

CAMDEN, city, port of entry, and county-seat of Camden co., N. J.; on the Delaware river, opposite Philadelphia, with which it is connected by several ferries. The city is situated on a level plain and the streets cross one another at right angles. It is noted for its immense market gardens and manufactures, and is the site of several large shipbuilding concerns. Area, 5 square miles.

The city has municipally owned water-works, and there are excellent gas and electric light plants and sewerage sys-

tem. There are 200 miles of paved streets and 115 miles of water mains. The educational facilities comprise 38 public schools with an enrollment of over 20,000 pupils besides a public and private high school. There are 9 banks with a combined capital of over \$3,000,000. The principal industries are shipbuilding, worsted goods, oil cloth, boots and shoes, textiles, talking machines, foundry products, pens, and soups. The total assessed realty valuation in 1919 was \$74,449,310. The net funded debt was \$4,836,155. The budget was \$1,874,286.

History.—The city was chartered in 1828, and became an important commercial and business center with the incorporation of the Camden and Amboy railroad in 1833. Pop. (1910) 94,538; (1920) 116,309.

CAMDEN, a town and county-seat of Kershaw co., S. C.; on the Seaboard Air Line, the Southern, and the Atlantic Coast Line systems; 32 miles N. E. of Columbia. It has extensive cotton and grain interests and is a health resort for sufferers from throat and lung troubles. Camden was the site of three noted battles. On Aug. 16, 1780, the American forces under General Gates, 3,600 strong, chiefly militia, were totally defeated by Lord Cornwallis. In this action Baron De Kalb, commanding the right wing, was mortally wounded. Congress erected a marble monument in his honor on the street which bears his name; La Fayette laid the corner stone in 1825. On April 25, 1781, Greene, who had succeeded Gates, was attacked and worsted by Lord Rawdon at Hobb-kirk's Hill, near Camden. On Feb. 24, 1865, Camden was taken by General Sherman, after a lively skirmish.

CAMDEN, CHARLES PRATT, MARQUIS, an English statesman, youngest son of Sir John Pratt, Chief-Judge of the Court of King's Bench; born in 1714. After having studied for the law, he was called to the bar in 1738. After nearly 20 years devoted to close study and but little employment, he was appointed attorney-general, and later lord chief-justice. In 1765 he was raised to the peerage as Baron Camden. He distinguished himself at once by his exertions in behalf of the American colonies, and in 1766 rose to the highest legal dignity, that of lord high chancellor. He died in London April 18, 1794.

CAMEL, a genus of ruminant quadrupeds, characterized by the absence of horns; the possession of incisive, canine, and molar teeth; a fissure in the upper lip; a long and arched neck; one or two

humps or protuberances on the back; a broad elastic foot ending in two small hoofs, which does not sink readily in the sand of the desert. The native country of the camel is said to extend from Morocco to China, within a zone of 900 or 1,000 miles in breadth. The common camel (*Camelus Bactrianus*), having two humps, is only found in the N. part of this region, and exclusively from the ancient Bactria, now Turkestan, to China. The dromedary, or single-hump camel (*Camelus dromedarius*, or Arabian camel) is found throughout the entire length of this zone, on its S. side, as far as Africa and India. The Bactrian species is the larger, more robust, and more fitted for carrying heavy burdens. The dromedary has been called the race-horse of its species. To people residing in the vicinity of the great deserts the camel is an invaluable mode of conveyance. It will travel three days under a load and five days under a rider without drinking. The stronger varieties carry from 700 to 1,000 pounds burden.

The camel's power of enduring thirst is partly due to the peculiar structure of its stomach, to which are attached little pouches or water cells, capable of straining off and storing up water for future use, when journeying across the desert. It can live on little food, and that of the coarsest kind, leaves of trees, nettles, shrubs, twigs, etc. In this it is helped by the fact that its humps are mere accumulations of fat (the back-bone of the animal being quite straight) and form a store upon which the system can draw when the outside supply is defective. Hence the camel driver who is about to start on a journey takes care to see that the humps of his animal present a full and healthy appearance. Camels which carry heavy burdens will do about 25 miles a day; those which are used for speed alone, from 60 to 90 miles a day.

The camel is rather passive than docile, showing less intelligent co-operation with its master than the horse or elephant; but it is very vindictive when injured. It lives from 40 to 50 years. Its flesh is esteemed by the Arab and its milk is his common food. The hair of the camel serves in the East for making cloth for tents, carpets, and wearing apparel. It is imported into European countries for the manufacture of fine pencils for painting and for other purposes. The South American members of the family Camelidae constitute the genus *Auchenia*, to which the llama and alpaca belong; they have no humps.

CAMELLIA, a genus of plants, order Ternströmiaceæ (theads). It is very

near akin to *thea*, which contains the tea plant; indeed, some botanists combine the two genera into one. The native countries of the camellias are the E. side of the Himalaya mountains, Cochin-China, China, Japan and the Eastern Islands.

CAMELOPARD, a name given to the giraffe (*Camelopardalis giraffa*), originally from the notion that it was a kind of hybrid between a camel and leopard. It constitutes the only species of its genus and family (*Camelopardalidae* or *Devexa*).

CAMELOPARDALIS, one of the N. circumpolar constellations added by Hevelius in 1690. It is a large, irregularly shaped constellation, something like the animal, and is more than 40° in length, with its head close to the North Pole. It contains no stars brighter than the fourth magnitude. *Camelopardalis* borders upon *Ursa Minor*, *Draco*, *Ursa Major*, *Lynx*, *Auriga*, *Perseus*, *Cassiopeia*, and *Cepheus*.

CAMELOT (kam'e-lot), a name applied in the mediæval romances to the splendid "City of Legions" which grew up out of the permanent quarters of the Second Augusta Legion at Caerleon-upon-Usk, but was built earlier by the mythical Belinus. The name is familiar to readers of Tennyson.

CAMEL'S HUMP, one of the peaks of the Green Mountains, in Vermont, 17 miles W. of Montpelier.

CAMEO, a term applied to gems of different colors sculptured in relief. The art of engraving on gems boasts of high antiquity, having been practiced with various degrees of success by the Egyptians, Greeks, and Romans. It was revived in Italy in the 15th century, and is even at the present day cultivated with considerable success. The cameos of the ancients were usually confined to the agate, onyx, and sard, which, on account of the variety of their strata, were better suited to display the artist's talents; but they were also occasionally found executed on opal, beryl, or emerald, and even on a sort of factitious stone, the *Vitrum obsidianum* of Pliny, distinguished by the moderns as the antique paste. One of the most famous cameos is the onyx at present in Paris called the "Apotheosis of Augustus." It is 1 foot in height, and 10 inches in width.

CAMERA OBSCURA, an optical instrument used to view or sketch objects at a short distance. It consists of a rectangular box, formed of two parts sliding in each other, like the joints of a telescope, so as to adjust the focus to

bodies more or less distant. A tube with a lens is fixed in one side of it, and is turned to the object to be represented. The rays entering fall on a mirror sloped at an angle of 45° , which reflect them upward to the observer's eye. It is convenient that they may be made to pass through a horizontal plate of glass, on which tracing paper may be placed so as to enable one to draw the figure if he be so disposed, but now this is generally done by photography. A lid to the box is of use in ridding the observer of superfluous light. It is supposed to have been invented by Baptista Porta in the 16th century, although it is said that Roger Bacon wrote a description of it 300 years before.

CAMERA, PHOTOGRAPHIC, a camera obscura, so constructed that sensitized plates or films may be placed at the back and receive the image. There are many styles of camera in use, those of the tripod variety being used for portraits and landscapes, where a long exposure is required, and the hand camera used by tourists on account of its convenient shape and size. See PHOTOGRAPHY.

CAMERON, JOHN, a Scotch scholar; born in Glasgow about 1579, and educated at the university of that city. In 1600 he went to the Continent, where his ability and erudition secured for him several appointments at Bergerac, Sedan, Saumur, and other seats of learning. Returning to Great Britain in 1620, he was two years later appointed principal of the University of Glasgow; but in less than a year he returned to Saumur, and thence to Montauban, where he received a divinity professorship. Here, as at Glasgow, his doctrine of passive obedience made him many enemies, by one of whom he was stabbed in the street, and he died from the effects of the wound in 1625.

CAMERON, SIMON, an American statesman; born in Maytown, Lancaster co., Pa., March 8, 1799; began, when 9 years of age, to learn the trade of a printer. In 1820 he was editor of a paper in Doylestown, Pa., and in 1822 he held a similar post in Harrisburg. He then interested himself in banking and the building of railroads, and for a time served as Adjutant-General of Pennsylvania. From 1845 to 1849 he was United States Senator from Pennsylvania, elected by the Democratic party. He became a member of the Republican party on its formation, and in 1856 he was again elected United States Senator. He was unsuccessfully supported for the offices of both President and Vice-President in the

National Convention of 1860, and in 1861 he was appointed Secretary of War by President Lincoln. He advocated the arming of fugitive slaves, and other extreme measures. In January, 1862, he resigned from the Cabinet, and was appointed minister to Russia. He succeeded in gaining the support of the Russian government for the Union. In November of the same year he resigned, and lived in retirement till 1866, when he was again elected to the United States Senate. In 1872 he became chairman of the Committee on Foreign Affairs. In 1877 he retired from the Senate in favor of his son, James Donald Cameron. His influence over the Republican party was strong, and his power in the politics of his State practically absolute. He died in Maytown (near Donegal), Pa., June 26, 1889.

CAMEROON. See KAMERUN.

CAMILLA, a famous queen of the Volsci, who opposed Aeneas on his landing in Italy.

CAMISARDS, the title given to the Protestant insurgents in the Cévennes, after the revocation of the Edict of Nantes, from having worn their shirts over their dress by way of disguise, on the occasion of some nocturnal attacks. Their principal leader, Cavalier, succeeded so far as to effect a capitulation in their favor with the French government. He subsequently entered the English service, and at his death was Governor of Jersey.

CAMOENS, LUIS DE (kam'ō-ens), a Portuguese poet; born in Lisbon, probably in 1524 or 1525. Disappointed in love, he became a soldier, and served in the fleet which the Portuguese sent against Morocco, losing his right eye in a naval engagement before Ceuta. An affray into which he was drawn was the cause of his embarking in 1553 for India. He landed at Goa, but, being unfavorably impressed with the life led by the ruling Portuguese there, wrote a satire which caused his banishment to Macao (1556). Here, however, he was appointed to an honorable position as administrator of the property of absentee and deceased Portuguese, and here, too, in what were the quietest and most prosperous years of his life, he wrote the earlier cantos of his great poem, the "Lusiad." Returning to Goa in 1561, he was shipwrecked and lost all his property except his precious manuscript. After much misfortune Camoens in 1570 arrived once more in his native land, poor and without influence, as he had left it. The "Lusiad" was now

printed at Lisbon (1572), and celebrating as it did the glories of the Portuguese conquests in India, acquired at once a wide popularity. The king himself accepted the dedication of the poem, but the only reward Camoens obtained was a pittance insufficient to save him from poverty; and it is said that his faithful Javanese servant had often to beg food for them both in the streets. The "Lusiad" is an epic poem in 10 cantos. Its subject is the voyage of Vasco da Gama to the East Indies; but many other events in the history of Portugal are also introduced. The other works of Camoens consist of sonnets, songs, epigrams, dramas, etc. He died June 18, 1579.

CAMOMILE, or **CHAMOMILE**, a genus of compositæ. The species are annual and perennial herbs, all palæarctic. The most important species of the genus is *Anthemis nobilis*, which has long been known for the medicinal virtues of an infusion of its flowers (*Flores Anthemidis*) as a bitter stomachic and tonic. The plant is chiefly cultivated at Mitcham, Surrey, England, and at Kieritsch and elsewhere in Saxony. The largest, whitest, and most completely double flowers are most esteemed. The other British species are mere weeds; one of them, called stinking camomile (*A. cotula*), is so acrid as to blister the fingers. But the flowers of the Dyer's Camomile (*A. tinctoria*), a common on the Continent, yield a beautiful dye.

Wild camomile (*matricaria chamomilla*) is the common camomile of German writers. A cultivated variety of *M. Parthenium* (Feverfew) has also to be distinguished.

CAMORRA, a well-organized secret society, once spread throughout all parts of the kingdom of Naples. At one time the *Camorristi* were all-powerful, levying a kind of blackmail at all markets, fairs, and public gatherings, claiming the right of deciding disputes, hiring themselves out for any criminal service from the passing of contraband goods to assassination. They had central stations in all the large provincial towns, and a regular staff of recruiting officers. At the end of the 19th century the political power gained by the Camorra had become so notorious and scandalous, that the Italian Government found it necessary to interfere. This resulted in the complete political defeat of the Camorra. The society thereupon returned to its original character and resumed blackmailing, extortion, robbery, and murder. Its activities eventually were suppressed, at least to a certain extent, by

the trial and conviction, in 1912, of its principal leaders.

CAMOUFLAGE, in war, the art of concealing from the enemy by trickery



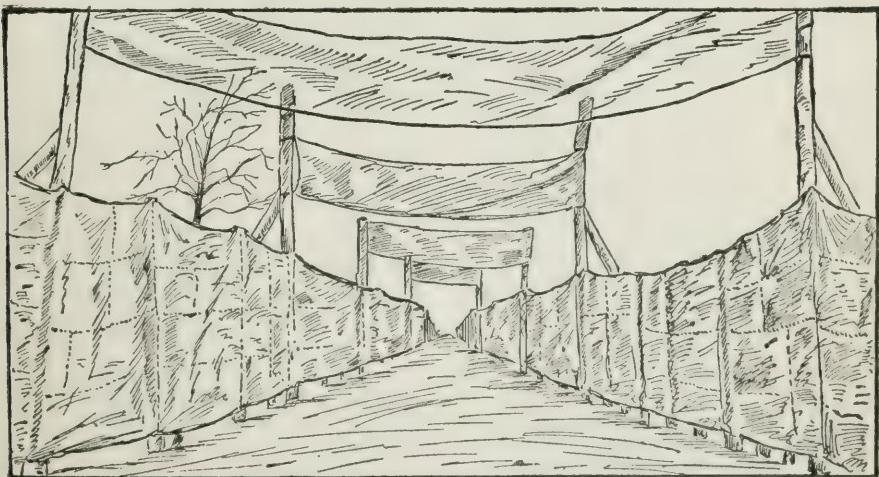
CAMOUFLAGE—A PARTI-COLORED COSTUME FOR OBSERVER OR SNIPER

or deceptive disguise; to make unrecognizable or impossible of discovery. The practice was carried on to a great extent during the World War, both on land

this end, the ships were painted with zig-zag markings, "zebra" stripes, wavering lines and various kinds of grotesque designs. These served to dizzy the sight and confuse the aim of the enemy. So effective were the results that by the end of the war there was scarcely a neutral or Allied vessel sailing the seas that was not thus camouflaged. The same art was resorted to on land to deceive the enemy gunners and aviators.

CAMP, the space occupied by an army halted with tents pitched. A Roman encampment was, as a rule, a square, each side of it 2,150 Roman or 2,077 1-3 English feet. Each of the sides had a gate. The *principia*, or principal street, ran from side to side, not quite bisecting each of them. In the rear of it was another one parallel to the first. Behind this, part of the allied forces were encamped. In the center, between the two streets, were the quarters of the prætor commanding and his staff. Between the *principia* and the front of the camp the body of the troops were encamped. A street called *quintana* ran parallel to the others through the center of this main part of the camp, and five streets crossed it at right angles.

In modern camps, if not near the enemy, infantry are distributed on dry ground, the cavalry near water, the artillery near good roads, the hospital and transport in rear. If near the enemy, they are arranged in order of battle. An intrenched camp is one surrounded



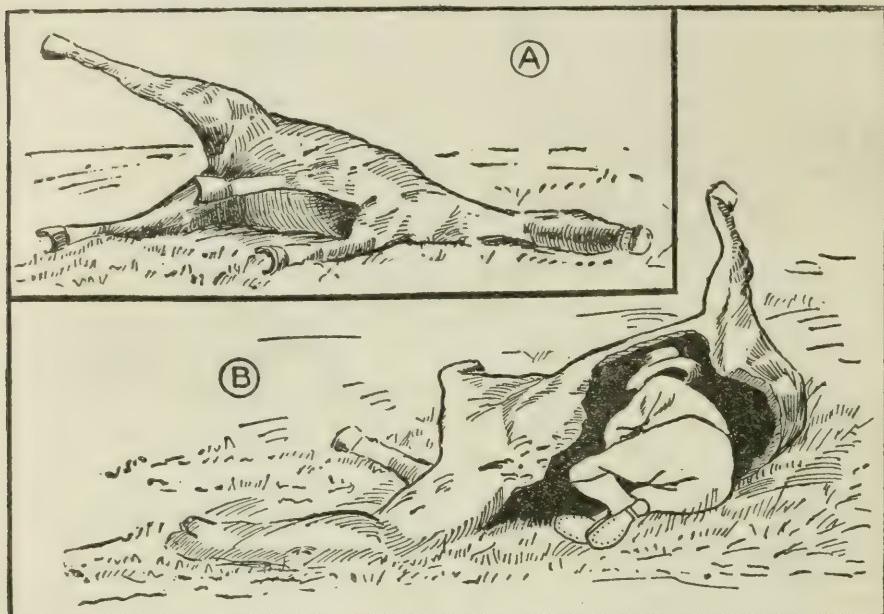
A ROAD PROTECTED FROM AERIAL OBSERVATION BY CAMOUFLAGE

and sea. The ravages of the submarine made it necessary for the Allies to render their ships as difficult a mark as possible to the German gunners. To

by earthworks. A flying camp is one to be occupied for a very brief period. A camp of instruction is one formed for the reception of troops to be maneuvered.

CAMP, WALTER, an American writer on athletics; born in New Haven, Conn., April 7, 1859. He was graduated at Yale (1880) and soon attained prominence with such writings as "Book of

CAMPAGNA DI ROMA (käm-pän'-yä), the coast region of middle Italy, in which Rome is situated, from 30 to 40 miles wide and 100 long, and forming the undulating mostly uncultivated plain

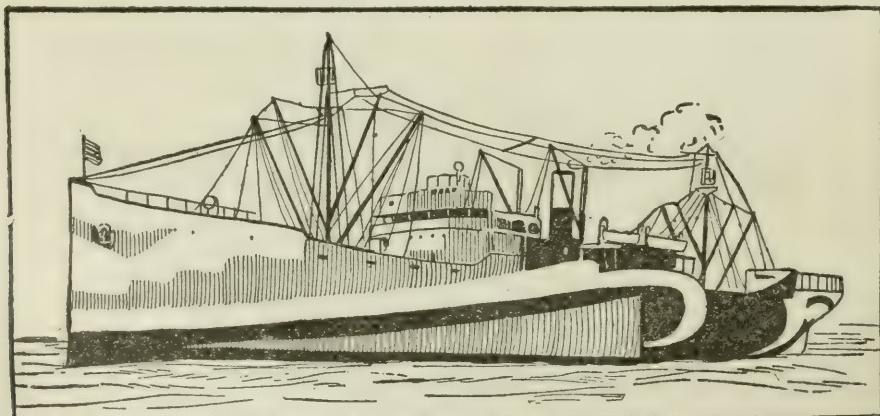


CONCEALED LISTENING POST

A. As it looks to the enemy.

B. Rear view showing observer.

"College Sports," "American Football," which extends from near Civita Vecchia or Viterbo to Terracina, and includes the Pontine Marshes. The district is vol-

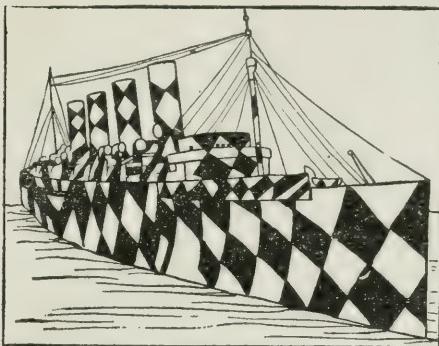


U. S. TRANSPORT, WITH DAZZLE CAMOUFLAGE

ous weekly papers devoted to sports and was a frequent contributor to popular magazines.

canic, and its lakes, Regillus, Albano, Nemi, etc., are evidently craters of extinct volcanoes. The soil is very fertile

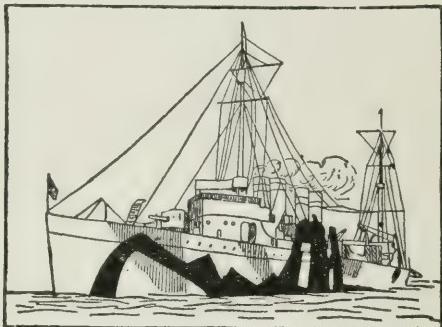
in the lower parts, though its cultivation is much neglected, owing to the malaria which makes residence there during mid-summer very dangerous; and during the



THE "MAURETANIA," CAMOUFLAGED IN THE WORLD WAR

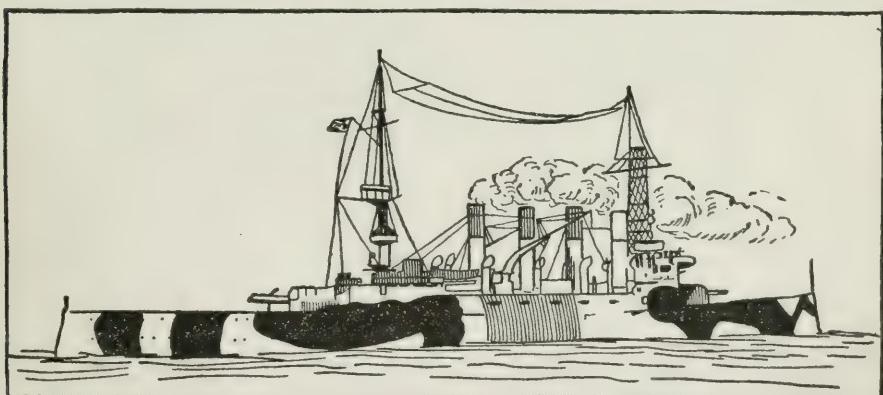
months of July, August, and September its inhabitants, chiefly herdsmen and peasants, seek refuge in Rome or the neighboring towns. In ancient times the Campagna, though never a salubrious district, was well cultivated and populated, the villas of the Roman aristocracy being numerous here. But inundations from the Tiber, and the discouragement of agricultural industry in the midst of

CAMPANIA, anciently a province on the W. coast of Italy, having Capua as its capital (now subdivided into the provinces of Benevento, Naples, Salerno, Avellino, and Caserta), lying between Latium, Samnium, and Lucania. Area, 6,277 square miles; pop. about 3,500,000. It was one of the most productive plains in the world, yielding in extraordinary abundance corn, wine, and oil; and by



CAMOUFLAGE ON U. S. DESTROYER

both Greek and Roman writers is celebrated for its soft and genial climate, its landscapes, and its harbors. It was the *regio felix* of the Romans, who built here many of their most splendid villas, and made Baiae, with its hot springs, the cen-



U. S. CRUISER CAMOUFLAGED

wars and devastations, left the stagnant waters to become a source of pestilence, and the district became little better than a desert, nothing of its former prosperity being visible but the ruins of great temples, circuses, and monuments, and long rows of crumbling aqueducts overgrown with ivy and other creeping plants. In recent years the government has done much to make it more healthful by improved drainage.

ter of their fashionable world. The promontory Misenum, Mount Vesuvius, the river Voltumnus, the towns Baiae, Cumæ, Liternum, Puteoli, Naples, Herculaneum, Pompeii, Nola, Salernum, Capua, etc., belonged to Campania. In very early times the Greeks founded Cumæ, from which Puteoli, Naples, and other places were colonized. The district was next conquered by the Etruscans, by whom Capua, Nola, and other towns were

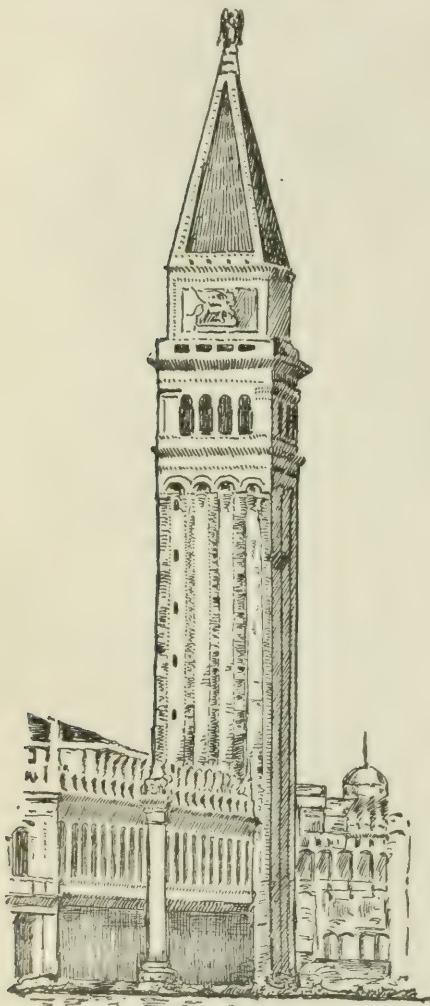
founded, but who succumbed to the more warlike and hardy Samnites, who, in their turn, yielded to the irresistible valor of Rome. Through all these vicissitudes of conquest the substratum of the people remained as at the beginning. The mass of the Campanians were essentially of Oscan race, and Oscan they remained. Indeed it is mainly from them that our knowledge of the Oscan language is de-

domestic edifices. The campanile at Cremona is very celebrated, being 395 feet high. That at Florence, by Giotto, is 267 feet high and 45 feet square. The most remarkable of the campaniles is that at Pisa, commonly called the "Leaning Tower." It is cylindrical in form, and surrounded by eight stories of columns, placed over one another, each having its entablature. The height is about 150 feet to the platform, whence a plumbline lowered falls on the leaning side nearly 13 feet outside the base of the building. The famous campanile of St. Mark's, Venice, begun in 874, completed in 1150, and remodeled in 1517, fell in 1902, but has been re-erected to conform to its appearance in 1517.

CAMPANINI, CLEOFONTE, an Italian musical director, born at Parma, Italy, in 1860. He studied music at the Royal Conservatory at Parma and made his first appearance as director in that city in 1881. His reputation spread rapidly through Italy and to other countries of Europe, and to South America. From 1897 to 1906 he was principal director of the Royal Opera, Covent Garden, London. His first visit to America was made in 1883, and from 1906 to 1909 he was director of the Manhattan Opera Company. From 1910 to 1913 he was general musical director of the Chicago and Philadelphia opera companies. He was general manager of these companies since 1913. Among notable productions which he conducted were "Salome," "Natoma," "Thaïs," "Samson and Delilah," and "Monna Vanna." He received many orders from the crowns of Italy, Austria, Spain, and Portugal, and from several countries in South America. He died in 1919.

CAMPANINI, ITALO (käm-pä-nē-né), an Italian singer; born in Parma, June 29, 1846. He served in Garibaldi's army in two campaigns, when only 15 years of age. He studied at the Parma Conservatory for one year, and in an appearance as the notary in "La Sonnambula" he was unsuccessful. He then studied with Lamperti at Milan, and made a successful appearance in "Faust" at La Scala, Milan. In 1872 he appeared in London, and a year later came to the United States as a member of the Nilsson Company, appearing in "Lucrezia Borgia." For a number of years he was considered the finest of living tenors. A disease of the throat afterward somewhat impaired his voice. He died near Parma, Italy, Nov. 23, 1896.

CAMPANULA, the bell-flower, so called from the shape of its flowers. An



CAMPANILE OF VENICE

rived, and one of their towns, Atella, introduced to the early Roman stage a species of popular drama or comedy.

CAMPANILE, a tower for the reception of bells, principally used for church purposes, but now sometimes for

extensive genus of herbaceous plants, giving the name to the order Campanulaceæ. *C. rapunculus* is much cultivated for the roots, which are boiled tender and eaten hot with sauce, or cold with vinegar and pepper. The best known species is *C. rotundifolia*, the hare-bell, or blue-bell of Scotland. A blue ink is made of its juice. *C. glauca* is said by the Japanese to be a tonic.

CAMPANULACEÆ, a natural order of plants, chiefly natives of this country, of the N. of Asia and Europe. More than 200 species of this family are known.

CAMPANULARIA, a genus of corals of the family Campanulariidae, in which the polypi assume a bell shape.

CAMPANULARIIDÆ, a family of marine polypi belonging to the order Hydroidea. Cells terminal, stalked campanulate; polypes with a large trumpet-shaped proboscis. There are six genera.

CAMPBELL, ALEXANDER, founder of the sect known as the "Disciples of Christ," or more commonly the "Campbellites"; born near Ballymena, in County Antrim, Ireland, Sept. 12, 1788. He emigrated to the United States in 1807. Though at first a Presbyterian, in 1812 he formed a connection with the Baptists. In 1826 he published a translation of the New Testament, in which the words "baptism" and "baptist" gave place to "immersion" and "immerser." By his discussions on public platforms, and his serial publications, viz., the "Christian Baptist" and the "Millennial Harbinger," as well as by his assiduity in preaching tours and in training young men for the ministry, Campbell gradually formed a large party of followers, who began about 1827 to form themselves into a sect under the designation of "THE DISCIPLES OF CHRIST" (q. v.). In 1841 Campbell founded Bethany College in West Virginia, where he died March 4, 1866. His writings were numerous.

CAMPBELL, BEATRICE STELLA TANNER, better known as Mrs. Pat. Campbell; an English actress, born at London in 1867. In 1884 she was married to Patrick Campbell, who six years later was killed in the South African War. She made her début on the professional stage in 1888 in Liverpool and scored an instant success. Since that time she has been one of the most popular actresses in England. She has played with equal success abroad, having made several professional tours in the leading cities of the United States. She has played the rôles of Juliet, Ophelia

and Lady Macbeth in the Shakespearian drama and has been especially well fitted with parts in "The Second Mrs. Tanqueray" and "The Notorious Mrs. Ebbesmith." Some of Bernard Shaw's plays also have demonstrated her abilities. In 1914 she married George Cornwallis-West.

CAMPBELL, SIR COLIN, LORD CLYDE, a British military officer; born in Glasgow, Oct. 20, 1792. His father was a carpenter, named Macliver, but Colin assumed the name of Campbell. He was severely wounded at the siege of San Sebastian and the passage of the Bidassoa. He took part in the expedition to the United States (1814), and then passed nearly 30 years in garrison duty. On the outbreak of the Crimean War, in 1854, he was appointed to the command of the Highland Brigade; the victory of the Alma was mainly his; and his, too, the splendid repulse of the Russians by the "thin red line" in the battle of Balaklava. When, on July 11, 1857, the news reached England of the sepoy mutiny, Lord Palmerston offered him the command of the forces in India. He effected the final relief of Lucknow, and on Dec. 20, 1858, having five months earlier been created Lord Clyde, announced to the Viceroy that the rebellion was ended. Returning next year to England, he was made a field-marshall, and received a pension of \$10,000. He died Aug. 14, 1863.

CAMPBELL, THOMAS, a Scotch poet; born in Glasgow, July 27, 1777; educated at its university. After leaving the university he resided for a short time in Edinburgh, and all at once attained the zenith of his fame by publishing, in 1799, his "Pleasures of Hope." It produced an extraordinary sensation. In 1803, after spending some time in Germany, Campbell published an edition of the "Pleasures of Hope," with the addition of some of the finest lyrics in the English language, including "Hohenlinden," "Ye Mariners of England," and the "Exile of Erin." In 1803 he went to London, and in 1806 obtained a pension of £200 through the influence of Mr. Fox. After this he appears for a time to have given his attention less to poetry than prose, and wrote various compilations, articles for Brewster's "Edinburgh Encyclopædia," etc. In 1809 he again made his appearance as a poet, and published "Gertrude of Wyoming," "Lord Ullin's Daughter," and the "Battle of the Baltic." After publishing "Specimens of English Poets," accompanied by critical essays, he became editor, in 1820, of the "New Monthly Magazine." He took an active part in the foundation of London

University, and in 1827 was elected rector of Glasgow University. After this, though he continued to occupy himself with literature, and published his "Letters from the South," a "Life of Mrs. Siddons," and a "Life of Petrarch," his productions were much inferior to his earlier efforts. He died at Boulogne, June 15, 1844, and was interred at Poets' Corner, in Westminster Abbey, close to the tomb of Addison.

CAMPBELL, WILLIAM WILFRED, a Canadian poet; born in western Ontario, Canada, in 1861. He published "Lake Lyrics" (1889); "The Dread Voyage" (1893); "Mordred, a Tragedy," and "Hildebrand" (1895), dramas in blank verse; "Beyond the Hills of Dreams" (1899); "Collected Verse" (1906); "A Beautiful Rebel" (1909), a historical novel; etc. He also edited "The Oxford Book of Canadian Verse" (1914).

CAMPBELL-BANNERMAN, SIR HENRY, a British statesman, born in 1836. The latter part of his name was added to comply with the provisions of a will of an uncle on the maternal side. He entered political life early, and in 1868 was elected member of Parliament to represent the borough of Sterling. He was not possessed of great gifts, but had a most pleasing personality and the gift of harmonizing conflicting interests that stood him in stead during heated political conflicts. He was financial secretary of the War Office 1871-1874 and 1880-1882 and Secretary of the Admiralty 1882-1884. In the latter year he became Chief Secretary of Ireland, and later served two terms as Secretary of War. He became the head of the Liberal party in 1889 and was made Premier Dec. 4, 1905, after the resignation of the Balfour cabinet. His administration was notable for his ability of combining labor and liberal elements in harmonious co-operation. He resigned the premiership in April, 1908, and died in London on the 22d of the same month.

CAMPBELL ISLANDS, a group of lonely islands to the S. of New Zealand, in 52° 34' S. lat., and 169° 12' E. long. Though they rise to a height of 1,498 feet, and are only 85 square miles in area, they are yet valuable on account of their harbors. They are also scientifically interesting, being volcanic, and displaying a rich and rare flora.

CAMPBELLITES, the followers of Rev. John McLeod Campbell, of Dunbartonshire, who was deposed from the Church of Scotland, May 24, 1831, for teaching the universality of the Atone-

ment. He established a church at Glasgow in 1833. The name is sometimes erroneously applied to the church founded in the United States by Thomas and Alexander Campbell, and by its members called Christians, Christian Church, or DISCIPLES OF CHRIST (q. v.).

CAMPEACHY, or SAN FRANCISCO DE CAMPECHE, a seaport on the W. side of the peninsula of Yucatan, Mexico, on a bay of the same name. It has a citadel, university, naval academy, and shipbuilding docks. The haven is safe, but very shallow, and the trade, principally in logwood and wax, has greatly fallen off, while cigars and palm-leaf hats are almost the only manufactures. Founded in the middle of the 16th century, it was taken, occupied, and burned by buccaneers in 1685. Estimated pop. about 17,000. Campeachy is the capital of a State of the same name, which has an area of 18,089 square miles and a population of about 90,000.

CAMPEGGIO (käm-ped'jō), CARDINAL LORENZO, an Italian clergyman; born in Bologna, in 1472. He studied law, and married early, taking holy orders after his wife's death. He was made Bishop of Feltri, and sent by Leo X. on a mission to the Emperor Maximilian, being created a cardinal in his absence (1517). Next year he visited England as papal legate to incite Henry VIII. against the Turks, and was well received. In 1524 he obtained the bishopric of Salisbury and the archbishopric of Bologna, and he presided the same year at the Ratisbon diet; in 1582 he was despatched to England to hear the famous divorce suit of Henry VIII. against Catharine of Aragon. Perplexed betwixt his own private instructions, pity and regard for the unhappy queen, the dubious counsels of Wolsey, and the imperious impatience of the King, and racked the while by the pains of a severe gout, the cardinal ended by displeasing all parties; and his final revoking of the cause to Rome led ultimately to the King's rupture with the papal court. He died in Rome, July 19, 1539.

CAMPERDOWN, or CAMPERDUIN, sandy hills or downs on the coast of Holland, S. of the Helder, off which the British, under Admiral Duncan, gained a hard-won naval victory over the Dutch, under De Winter, Oct. 11, 1797.

CAMPFIRE GIRLS OF AMERICA, an organization for young girls founded in 1912. Its chief objects are the maintenance of health by wholesome outdoor life and exercise and the promotion of various forms of social welfare. During

the World War the Campfire Girls gave service in various lines of activity, in cultivating war gardens, and making garments and bandages for the Red Cross. In the Liberty Loan campaigns they sold and subscribed for millions of dollars' worth of bonds, and were equally active in the sale and purchase of Thrift Stamps. They conserved food, cared for little children while the mothers were away at work, and contributed largely to the support of French and Belgian orphans. The membership in 1919 consisted of 7,384 camps and 100,747 members. The main body is in the United States, but there are branches in England, Scotland, Canada, South America, China, Africa, Japan, Alaska, Hawaii, Porto Rico, and the Philippines.

CAMPHINE, the commercial term for purified oil of turpentine, obtained by distilling the oil over quicklime to free it from resin. It is used in lamps, and gives a very brilliant light; but, to prevent smoking, the lamp must have a very strong draught. With oxygen it forms camphor.

CAMPHOR, a powerful diffusible stimulant and antispasmodic, extensively used in medicine and in the manufacture of celluloid and explosives. Borneo or Sumatra camphor is a kind of camphor made from *Dryobalanops aromatic*, or *Dryobalanops camphora*, a genus of the order Dipteraceæ, or Dipteraids. It differs from ordinary camphor in having six-sided crystals.

In chemistry, the symbol of camphor is $C_{10}H_{16}O$. It is called also laurel camphor. Camphor is obtained by distilling with water the leaves and wood of the camphor-tree, *Camphora officinarum*, formerly called *Laurus camphora*. It is a solid white volatile crystalline mass, tough and difficult to powder, has a peculiar odor; thrown on water it revolves and is slightly soluble. It is very soluble in alcohol, ether, and strong acetic acid. It has a dextro-rotary action on polarized light. Many essential oils deposit an inactive variety. Most of the camphor of commerce comes from Formosa. It is used to preserve natural history collections and cloths in drawers from the ravages of insects.

CAMPION, THOMAS, an English poet; born about 1570; was by profession a medical man. He wrote a volume of "Poems" (1595), being Latin elegies and epigrams. He published (1610-1612) four "Books of Airs," containing songs written by himself to airs of his own composition. He died in London, March 1, 1619.

CAMPOBASSO, formerly **MOLISE**, a province of Abruzzi, central Italy; is a very mountainous and sterile region; has comparatively little industry. There are some iron and steel manufactures; and grain, wine, and vegetables are produced. Capital, Campobasso (pop. about 16,000). Area, 1,691 square miles; pop. about 360,000.

CAMPOBELLO, an island in Passamaquoddy Bay, in Charlotte co., New Brunswick. It is noted as a summer resort. Though copper and lead ores exist, the inhabitants are chiefly engaged in the herring, mackerel, and cod fisheries. The island is 8 miles long. Pop. about 1,500.

CAMPO-FORMIO, a town in Italy, 66 miles N. E. of Venice, famous for the treaty of peace between Austria and France, which was signed in its neighborhood on Oct. 17, 1797. Its chief provisions were that Austria should cede the Belgian provinces and Lombardy to France, receiving in compensation the Venetian states.

CANA (called by the natives *Kefr-Cana*; or *Kana-el-Jelil*), a town of Palestine, celebrated in Scripture as the scene of our Lord's first miracle, when he turned water into wine, is now a small village of a few hundred inhabitants, who are principally Greek Christians, or Nazarenes, situated about 13 miles W. of the Sea of Galilee, and 6 miles N. of Nazareth.

CANAAN (*kā'nan*), the country W. of the Jordan, called also Chanaan, and the Land of Canaan, after one of the sons of Ham. The Greeks applied the term *Cana* to the entire region between the Jordan and the Mediterranean up to Sidon, afterward termed by them Phœnicia, a name which by degrees came to be confined to the N. coast district, or Phœnicia proper. Canaan is generally considered equivalent to the Land of Israel or Palestine.

CANAANITES, THE, a word used in two senses: (1) For the tribe of the "Canaanites" only—the dwellers in the lowland. The whole of the country W. of Jordan was a "lowland" as compared with the loftier and more extended tracts on the E. (2) Applied as a general name to the non-Israelite inhabitants of the land.

Like the Phœnicians, the Canaanites were probably given to commerce; and thus the name became probably in later times an occasional synonym for a merchant.

Like almost all nations, the inhabitants of Canaan had legends that their

long-time predecessors were giants. These were considered aborigines, and appear to be of several races, as Anakim, Rephaim, Emin, Suzites, Zamsummim, Avim, and Horim. From earliest historical times, however, the inhabitants were of some incoming Semitic stock, variously named, and only hazily distinguishable now. At first they were sometimes all grouped as Amorites, but at a later date seven tribes were listed: Hittites, Canaanites, Amorites, Gergazites, Perizzites, Jebusites, and Hivites. When the Israelites displaced them these peoples were at an advanced stage of civilization. The Hittites founded an empire to the N., and much is now known about them. See **HITTITES**. Still later there were Canaanites alongside of or intermingled with the Hebrews. The Phoenicians were of Canaanitish origin, and occupied the coast plain to the N.; the Philistines, of the same general origin, on the coast to the S.

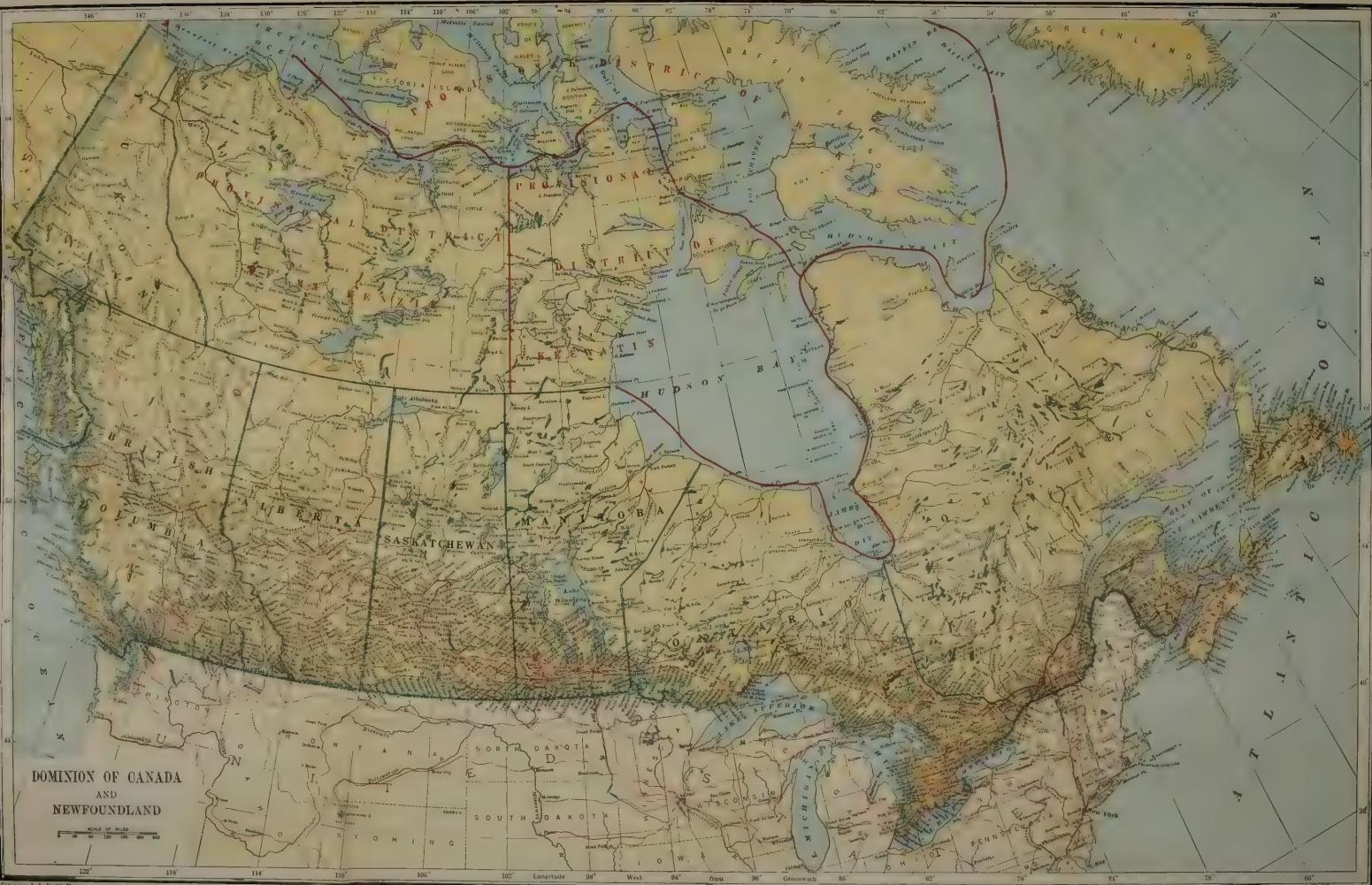
CANADA, DOMINION OF, a Federal Union of Provinces and Territories, comprising all the British possessions in North America, excepting Newfoundland; bounded by the Arctic, Pacific, and Atlantic oceans, and the United States, including Alaska. The area in square miles of individual Provinces and Territories, since the reallocation in 1912, is as follows: Prince Edward Island, 2,184; Nova Scotia, 21,428; New Brunswick, 27,895; Quebec, 706,834; Ontario, 407,262; Manitoba, 251,832; Saskatchewan, 251,700; Alberta, 255,285; British Columbia, 355,855; Yukon District, 207,076; Northwest Territories, 1,242,224; total, 3,729,665. Pop. (1911) 7,206,643; (1919, est.) 8,835,602; capital, Ottawa.

Topography.—Extending over so large a territory, Canada presents a great variety of surface. Along the Atlantic coast is a range of hills extending inland from 15 to 20 miles. About 60 miles inland, the Cobequid mountains, some reaching an altitude of 1,100 feet, extend in a line parallel to the coast from the Bay of Fundy, through Nova Scotia to the Strait of Canso. Nova Scotia is a long fertile plain. A third mountain range crosses New Brunswick from the Gulf of St. Lawrence to the State of Maine. An extensive plateau intervenes between these mountains and the Cobequids. The central part of the Dominion consists of a vast undulating plain, extending W. to the foothills of the Rocky Mountains. This section includes the W. half of Assiniboina and the whole of Alberta, and consists of three prairie plateaus. The E., 800 feet high, known as the Red River Valley and Lake Win-

nipeg region, contains about 7,000 square miles of valuable wheat land. The middle plateau has an area of 105,000 square miles, altitude, 1,600 feet, and includes the Qu'Appelle and Assiniboina river valleys. The third plateau extends 450 miles E. from the Rocky Mountains, and has an average altitude of 3,000 feet. The Rocky Mountains are the most prominent physical features of the Dominion, and stretch from Alaska to California, some of the peaks attaining a height of 16,000 feet. Among the highest are Mt. Hooker, 16,760 feet; Mt. Brown, 16,000 feet, and Mt. Murchison, 15,700 feet. The Canadian Pacific railroad crosses the Rockies through the Kicking Horse Pass, just S. of Mt. Murchison, at an altitude of 5,300 feet. Between these mountains and the Pacific coast are the Selkirk Mountains, the Gold Range, a central plateau, and the Cascade or Coast Range. The Cascade or Coast Range is a continuation of the Sierra Nevada of California, reaches an altitude of 7,000 feet, and contains many extinct volcanoes. The Selkirk range has a glacier region of greater extent than that of Switzerland. The coasts of the Dominion have numerous indentations, the largest of which are the Gulf of St. Lawrence, the Gulf of Georgia, the Bay of Fundy, and the Bay of Chaleurs. In the N. are many large bays or inland seas, of which Baffin Bay on the N. E., and Hudson Bay, near the center of the Dominion, are the largest. The lakes of Canada are the most extensive in the world; besides the Great Lakes, Superior, Huron, Michigan, St. Clair, Erie, and Ontario, there are many large lakes in the Northwest Territories and Manitoba. Among these are the Great Slave, 12,000 square miles; Great Bear, 10,000 square miles; Winnipeg, 8,500 square miles; Athabasca, 2,000 square miles; and Manitoba, 1,900 square miles. The principal rivers are the Mackenzie, Copper Mine, Great Fish, Slave, Fraser, St. Lawrence, Saskatchewan, and a part of the Yukon.

Mineralogy.—Canada is very rich in its mineral deposits. The most important minerals found are gold, silver, iron, copper, nickel, lead, and coal; besides manganese, cobalt, asbestos, pyrites, phosphates, building stones, marbles, petroleum, and salt. Gold is principally mined in British Columbia, Yukon Territory, and Nova Scotia. In British Columbia and Yukon Territory the deposits of the Klondike region and the Yukon and Fraser rivers are among the richest in the world. The Nova Scotia gold district extends over an area of 6,000 square miles, and the metal is extracted from the quartz in a very fine

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and pure state. Gold is also found in rich deposits in the Northwest Territories. Extraordinary silver deposits are found in several islands on the N. shore of Lake Superior and in argenteiferous galena in Quebec, Nova Scotia, and British Columbia. Copper abounds in British Columbia, Nova Scotia, Ontario, Quebec, New Brunswick, and the Northwest Territories. The copper found on the N. shore of Lake Superior, and in Ontario, is of excellent quality. Iron is found in great quantities at Hull, Ontario, in a bed 90 feet thick. This ore is magnetic, yielding 70 per cent. pure iron. Magnetite is also found in Nova Scotia, and New Brunswick. Silver-bearing lead, tin, zinc, and bismuth are found in many places. Coal exists in Nova Scotia, New Brunswick, British Columbia, and the Northwest Territories. The Nova Scotia and New Brunswick fields are of great extent, and the value of this output in British Columbia alone is second only to that of its gold. Anthracite is found in Queen Charlotte and Vancouver Islands. Among the precious stones of Canada are diamonds, rubies, pearls, amethysts, carnelians, chaledonies, porphyries, agates, and jaspers. The total value of the mineral production in 1919 was \$167,000,000. The gold production was valued at \$16,275,000, the coal production at \$12,500,000, the silver production at \$13,500,000, and the production of pig iron at \$920,000. During the four years down to the close of 1919, the prices of minerals and metals were greatly enhanced, and this contributed in a large measure toward increasing the total value of the mineral production. In addition to those mentioned above, other important metallic products were cobalt, copper, lead, molybdenite, nickel, zinc, graphite, gypsum, magnetite, and mica.

Soil, Climate, etc.—The soil is generally clay, beneath a rich vegetable loam, and is covered in its natural state with oak, elm, walnut, whitewood, pine, fir, and maple trees. It is well adapted to general agriculture, and is capable of the highest cultivation. The climate varies greatly. In the S. provinces the summers are warm, and, although the winters are cold, they are pleasant and bracing. In the W. the climate is milder than in the rest of the Dominion. In the extreme N. the ground is covered with snow early the entire year and the winters are very severe. The greater part of the Dominion is covered with forests.

Agriculture.—The greater part of Nova Scotia, Quebec, New Brunswick, Ontario and Vancouver Island, besides the coun-

try lying between Lake Superior and the Rocky Mountains, is admirably adapted to agriculture. The total farm wealth of Canada exceeds \$7,000,000,000. The field crops in 1919, both in value of crops and acreage, are the highest on record. Their value amounted to \$1,448,153,500, compared with \$1,372,935,570 in 1918. The value of the most important products is as follows: Wheat, \$360,573,000; oats, \$317,097,000; barley, \$77,462,700; rye, \$14,240,000; peas, \$9,739,300; beans, \$6,214,800; buckwheat, \$15,831,000; mixed grains, \$37,735,400; flax, \$22,609,500; corn for husking, \$22,080,000; potatoes, \$118,894,200; turnips, etc., \$54,958,700; hay and clover, \$338,713,200; fodder corn, \$34,179,500; sugar beets, \$2,606,000, and alfalfa, \$10,800,200. The crops yielded in 1919 over a billion bushels of grain, and over 20,000,000 tons of hay and corn. There were 667,951 farms. Of these 184,347 were in Ontario; 143,958 in Quebec; 103,912 in Saskatchewan; 67,603 in Alberta; 53,638 in Nova Scotia; 49,855 in Manitoba; 37,204 in New Brunswick; 13,743 in British Columbia, and 13,705 in Prince Edward Island. Within 50 years the grain-growing center has shifted from the E. to the W. In 1870 85 per cent. of the wheat, oats, and barley were grown in Ontario. In 1919 Saskatchewan alone produced over 60 per cent. of these products in all Canada. The estimated wool yield was 17,300,000 pounds. Canada stood fifth among the world's wheat-producing countries. There were in operation in 1919 nearly 4,000 grain elevators, with a capacity of 221,279,964 bushels.

Fisheries.—The fisheries stand fifth in order of value among Canadian industries. The product of the fisheries in 1919 was \$37,137,072. A capital of over \$30,000,000 is employed, and about 100,000 persons are engaged in fishing, or in handling fishing products. There were in 1919 over 1,300 vessels, and 40,000 boats engaged in fishing. These were valued at about \$10,000,000.

Banking.—There were in 1919 a total of 4,442 branch banks in Canada. Bank clearings for the year amounted to \$16,709,598,895. The total deposits in banks amounted to \$1,841,478,895, and the total assets of the banks amounted to \$2,965,373,675.

Commerce.—The foreign trade of Canada for the year ending Sept. 30, 1919, was as follows: Imports \$886,134,043, of which \$550,516,656 were dutiable goods, and \$335,617,387 were free goods. The exports amounted to \$1,260,312,671, of which \$1,201,801,387 were Canadian goods, and \$58,511,284 were foreign goods. The imports from the United States in 1918 amounted to

\$701,087,586. The imports from the United Kingdom amounted to \$79,023,483. The exports to the United States in 1919 amounted to \$433,337,935, and to the United Kingdom, \$540,378,091. The principal exports were wheat, flour, oats, fish and fish products, wood and lumber, wood pulp, printing paper, and agricultural products. In the year ending June 30, 1920, Canada exported to the United States goods valued at \$537,337,381, and imported from the United States goods valued at \$890,135,023.

Education.—Primary education is compulsory. The percentage of illiteracy is 11.02 per cent., the highest among the foreign born and the lowest among the native born. There were in 1919 24,871 primary and secondary schools, with 36,000 teachers and 1,250,000 pupils. The Provincial Governments have control of education of elementary schools, secondary schools, normal schools, and universities. In Ontario, Quebec, Alberta, and Saskatchewan there are separate schools for Roman Catholics. In other provinces the schools are non-sectarian. There are 22 universities, and each Province has one or more. In addition, there are several colleges. The most important of the universities are the University of Toronto, McGill University, and Laval University, which is French-Canadian. In the universities and colleges are about 16,000 students. The total expenditure for public education is over \$60,000,000 annually.

Religion.—The Roman Catholic Church is the oldest and largest religious body in Canada, and represents about 42 per cent. of the population. The Church of England has 28 dioceses, with 1,750 clergymen and over 2,000 churches. The Presbyterian Church has about 1,900 clergymen and about 335,000 communicants. The Methodists have about 380,000 communicants, the Baptists about 140,000, and practically all the other Protestant denominations are represented. The Roman Catholic Church is represented by a cardinal, 11 archbishops, 30 bishops, about 5,000 priests, and 3,000 churches.

Railways.—In 1919 there were approximately 35,000 miles of railway in operation. During the year 433 miles of new first track were completed and put in operation. The Canadian Pacific has the longest mileage, with 13,000 miles. The mileage of other principal roads is as follows: Canadian Northern, 9,479; Grand Trunk in Canada, 3,578; Transcontinental, 2,002; Inter-colonial, 1,592; Grand Trunk Pacific, 1,794. The government has put into effect a system of nationalization of

railroads, and in 1919 it took over the Grand Trunk railroad. The Canadian Pacific was already nationalized.

Telegraphs and Telephones.—There are in the Dominion about 600,000 telephones, with a wire mileage of 1,708,202. The telephone companies employ over 16,000 wage earners. There are about 65,000 miles of telegraph wire, of which about 50,000 is private and 12,000 government. There were in 1919 11 operating telegraph and cable companies, and 4,615 offices, with a capital of \$75,000,000. The gross earnings of the telegraph, wireless, and government telegraph service stations is about \$10,000,000 annually.

Postoffices.—There were in 1919 about 13,000 postoffices. There were 3,733 rural mail delivery routes. There were in 1918 4,931 money order offices, which issued 9,919,665 orders, valued at \$142,959,168.

Manufactures.—The census of manufactures of the year 1917 was completed in 1918. The census is taken every two years. The main results of this census were as follows: The number of manufacturing establishments, 34,380; capital invested, \$2,772,517,680; number of wage earners, 619,473; wages paid, \$457,245,456; cost of materials, \$1,602,820,631; and the value of the products, \$3,015,560,869. The capital invested in the leading industries was as follows: Electric light and power, \$356,004,168; pulp and paper, \$186,787,405; log products, \$149,266,019; cars and car works, \$98,274,585; steel furnaces and rolling mills, \$91,894,777; flour and grist mill products, \$72,573,982; agricultural implements, \$70,493,801; foundry and machine-shop products, \$69,915,032; car repair shops, \$68,763,298; slaughtering and meat products, \$68,145,347.

Finance.—The total revenue for the year 1918-1919 was \$312,946,740. The expenditures were as follows: Consolidated fund, \$232,731,282; capital account, \$25,031,266; war account, \$446,519,439; capital expended for railways and canals, \$19,325,918; and for public works, \$5,705,347. The net debt on Dec. 31, 1919, was \$1,838,000,000. The net debt prior to the war was \$335,996,860. The debt per capita before the war was \$42, and at the close, \$250.

Government.—The government which originally constituted the Dominion of Canada was composed of Provinces of Canada, Upper and Lower, Nova Scotia, and New Brunswick. They were united in 1867 by the passage of the British North American Act. The act provides for a constitution "similar in principle to that of the United Kingdom," that the executive authority shall be vested

in the sovereign of Great Britain and Ireland, and carried on in his name by a Governor-General and Privy Council; that the legislative power shall be exercised by a Parliament composed of a Senate and a House of Commons. The powers of Parliament include all subjects not assigned exclusively to the Provincial legislature. Provision was made in the act for the admission of British Columbia, Prince Edward Island, the Northwest Territories, and Newfoundland into the Dominion. The last named has not joined itself to the Dominion. The Northwest Territory was acquired by the Dominion by purchase from the Hudson's Bay Company in 1869. The Province of Manitoba, made from a portion of this Territory, was admitted in 1870. British Columbia became a part of the Dominion in 1871, and in the same year Prince Edward Island was admitted. The Provinces of Alberta and Saskatchewan were admitted to the Union as Provinces on Sept. 1, 1905.

The members of the Senate are nominated for life. It is composed of 96 members. As the result of an amendment made in 1917, which increased the representation from the Provinces, the total number may not exceed 104. The House of Commons is elected by the people for five years, unless sooner dissolved, at the rate of one representative for every 30,819 persons. The Province of Quebec always has 65 members, and the other Provinces proportionately according to their population at each decennial census. The House of Commons consists of 234 members. The Governor-General forms a connecting link between the Crown and the Dominion, and is assisted in his functions by a council composed of 18 heads of departments, including the Premier, the President of the Privy Council, Secretary of State, Minister of Mines, Minister of Trade and Commerce, Minister of Justice, and Attorney General, Minister of Marine, Fisheries, and Naval Service, Minister of Militia and Defense, Postmaster-General, Minister of Agriculture, Minister of Public Works, Minister of Finance, Minister of Railroads and Canals, Minister of the Interior, Minister of Customs and Internal Revenue, Minister of Immigration and Colonization, and the Minister of Soldiers' Civil Re-establishment.

There is a Department of External Affairs which has charge of all imperial and inter-Dominion correspondence. The Dominion Bureau of Statistics was established in 1919.

The Provinces each have a separate parliament and an administration, with

a lieutenant-governor appointed, by the Governor-General as the executive. They have full power to regulate their own local affairs and disposition of their revenues, provided they do not interfere with the action and policy of the central administration. The Northwest Territories are governed by a commissioner and a council of four. The Territory of Yukon is governed by a chief executive officer and an executive council of 10 members, elected by the people.

Population.—The population of the Provinces in 1911, with the estimated population in 1918, are as follows: Alberta (1911) 374,663, (1918) 540,000; British Columbia (1911) 392,480, (1918) 400,000; Manitoba (1911) 461,630, (1918) 560,000; New Brunswick (1911) 351,889, (1918) 365,000; Nova Scotia (1911) 492,338, (1918) 510,000; Ontario (1911) 2,523,274, (1918) 2,799,000; Prince Edward Island (1911) 98,728, (1918) 100,000; Quebec (1911) 2,003,232, according to municipal statistics (1918) 2,432,251; Saskatchewan (1911) 402,431, (1918) 647,875; Yukon (1911) 8,512, (1918) 10,000; Northwest Territories (1911) 18,481, (1918) 20,000.

The largest cities are Montreal, estimated population (1918), 700,000; Toronto (1919), 499,278; Winnipeg, about 265,000; Quebec (1919), about 120,000; Ottawa (1919), 107,800; Victoria, about 65,000; St. John, about 63,000; and Halifax, about 62,000.

Immigration.—Following the close of the World War, legislation was passed restricting immigration and providing for strict selective tests for those coming into the country. The total number of immigrants in 1919 was 56,982. Of this, 9,194 were British, 40,715 from the United States, and 7,073 from other countries. The total immigration represented 53 nationalities. The total immigration from July, 1900, to March 31, 1919, amounted to 3,311,498. Of this, 1,118,946 were British, 1,268,793 American, and 853,039 from the continent of Europe.

Indians.—The Indian population in 1917-1918 was 105,998. These Indians had land under cultivation of 82,421 acres, with products that were valued at \$2,834,149. There were 339 Indian schools, including 58 boarding and 78 industrial schools. In these were a total enrollment of 12,413. Out of 15,000 Indians of military age over 3,500 enlisted and served in the war.

History.—In 1534 Jacques Cartier, a French navigator, entering the St. Lawrence on the festival of the saint of that title, took nominal possession of North America in the name of his king, Francis

I. In 1608 Quebec was founded by De Champlain; in 1623 he built Fort St. Louis, from which stronghold France ruled for 150 years a vast region extending E. to Acadia (now Nova Scotia), W. to Lake Superior, and ultimately down the Mississippi as far as Florida and Louisiana. The Recollet and Jesuit missionaries traversed the country in all directions, and underwent incredible hardships in their zeal for the conversion of the Indians. These fearless priests were the pioneers of civilization in the Far West, and to La Salle is due the discovery of the Mississippi valley. In 1670 Charles II. granted the Hudson's Bay Company the perpetual exclusive right of trading in territory watered by all the streams flowing into Hudson Bay. Garrisoned forts were raised at suitable points, and the bitter enmity between the French and the English traders frequently led to bloody struggles, in which sometimes the Indians also took a part. The most warlike native tribe was that of the Iroquois, who were persistent enemies of the French, while the peaceful Hurons were steady allies. Meanwhile, the wars on the American continent followed the course of the wars in Europe, until the long struggle between France and England for the supremacy in America came to a close on the "Plains of Abraham" in 1759, when General Wolfe defeated Montcalm. Peace was concluded between Great Britain and France, 1763, when Canada was formally ceded to England, and Louisiana to Spain. In the same year a small portion of the recently acquired territory was by royal proclamation organized under English laws. In 1774 the new province was extended by parliamentary enactment, and that under French laws, down the Ohio to its confluence with the Mississippi, and up the latter stream to its source. Finally, Canada receded to its present limits in 1783, giving up to the American republic at the close of the Revolutionary War, the sites of Minnesota, Wisconsin, Michigan, Ohio, Indiana, and Illinois. In 1791 Canada was divided under separate legislatures into two sections, the E. retaining French institutions, and the W. receiving those of England; and these sections, again, after political discontent had in each ripened into armed insurrection, were reunited for legislative purposes in 1841. In 1867 Upper and Lower Canada, Nova Scotia, and New Brunswick were united as the Dominion of Canada, and in 1870 the Hudson's Bay Company's territory was divided into Manitoba and the Northwest Territories and united to the Dominion. British Columbia entered the Union in 1871, and

Prince Edward Island in 1873. In 1870 and in 1885 there were outbreaks of half-breeds under Louis Riel. In 1893 a court of arbitration concerning the Bering Sea seal fisheries met in Ottawa, and in the same year Canadians were awarded 2,126 prizes at the Columbian Exposition at Chicago. The Sault Ste. Marie canal was opened Sept. 10, 1895, and in 1896 the boundaries of Quebec were extended to the shores of Hudson Bay, adding 118,450 square miles to its area. A new tariff was adopted in 1897, giving a preference to English goods. The gold discoveries of the Klondike in 1897 led to great improvement in the transportation service between Yukon and the rest of the Dominion.

For ten years following the election of Sir Wilfrid Laurier as Premier, in 1896, the Liberal party was in power. This period was marked by remarkable economic developments and the tightening of the ties of loyalty between Canada and the Empire. It was also marked by friendly and close relations between the United States and Canada. The participation of Canada in the Boer War indicated her feeling of loyalty toward the mother country.

Differences between the United States, Great Britain, and Canada were successfully settled during Laurier's government. This included the settlement of the Alaskan boundary, which had been a source of irritation for many years. The period was also marked by the development of the rich vacant lands of western Canada, to which American settlers in large numbers were attracted. In 1907 the Dominion entered upon the development of foreign relations, chiefly as a result of the objection against Japanese immigration and labor competition. As a result Canada was included in the commercial part of the treaty of alliance between Japan and Great Britain.

The revival of the issue of reciprocity of the United States brought about the defeat of the Liberal party in 1911. The initiative in the negotiations was taken by the United States under President Taft. Sir Wilfrid Laurier warmly favored reciprocity, but it was unpopular with the people, and the Liberals were decisively defeated. Robert Laird Borden became Premier. Under his administration the Dominion continued to develop economically and financially, and at the outbreak of the World War it was prepared to exert its entire power on the side of the Allies.

The part taken by Canada in the great conflict was a notable one. In the valor of her soldiers and the extent of her sacrifices she can bear comparison with any

of the participants. The mettle of Canadian troops was tested first at Ypres, where they stemmed the German rush toward Calais, April 22-27, 1915. At Festubert and Givenchy, in the following May and June, they sustained their reputation. Routine trench warfare followed for the greater part of the year, but in 1916 they fought brilliantly at the battles of St. Eloi in April, Sanctuary Wood in June, Hooge later in that month, and at Mouquet Farm and Courcelette in September and October, respectively. It was in 1917, however, that they covered themselves with deathless glory in the taking of Vimy Ridge, one of the most brilliant achievements of the entire war. In the early days of the great German drive in March, 1918, the Canadians performed heroic work in keeping the enemy in check, and when the tide of battle turned with the beginning of Foch's great counter-offensive of July 18, they were conspicuous in the work of driving the Germans out of France. They broke the enemy's lines at Arras in August and smashed the Queant-Drocourt spur of the Hindenburg line in September. Terrific fighting followed at Bourlon Wood, Cambrai, and Valenciennes, and on Nov. 10, the day before the armistice was signed, they took the town of Mons in a splendid bayonet charge. From the beginning to the end of the war their gallantry shed luster on Canadian arms. See WORLD WAR.

The total number of Canadian troops participating in the war was 595,440. Of these 59,575 lost their lives. The total casualties reported up to Jan. 15, 1919, were 218,463, made up as follows: Killed in action, 35,684; died of wounds, 12,437; died of disease, 4,087; wounded, 155,839; prisoners of war, 3,049; presumed dead, 4,682; missing, 398 and died in Canada, 2,287. The total number of troops who were transported overseas was 418,052.

The personnel of the Canadian navy at the signing of the armistice included 749 officers and men of the Royal Canadian Navy, and 4,374 officers and men of the Canadian Navy Volunteer Reserve. Over 1,700 men in addition had been recruited in Canada for the Royal Navy and were on service abroad. The work of the home forces consisted in patrolling the Canadian coast and waterways and in serving as convoys and protectors of the fishing fleet.

Five War and Victory Loans were issued in Canada during the war, the total subscriptions amounting to \$1,432,389,277.

Canada was also an important factor in the supply of munitions to the British Government.

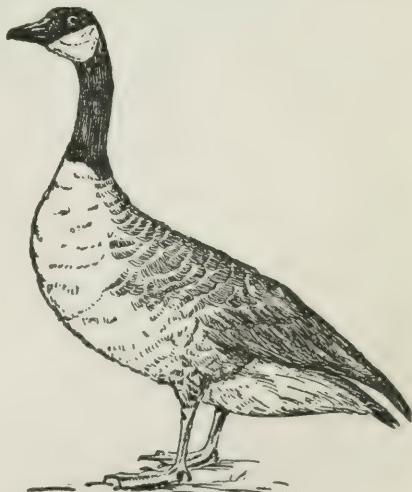
Voluntary contributions to the Red Cross, the Y. M. C. A., and other societies, for purposes connected with the war, totaled about \$95,000,000.

The years 1919 and 1920 were given up to reconstruction. In 1920 Sir Robert Borden resigned and was succeeded by Arthur Mighen, formerly Minister of Mines. In 1920 a new franchise bill was introduced by the Government. According to its terms the only requirements for franchise are British citizenship, residence in Canada for one year, and in the particular constituency for two months, and the attainment of the age of 21. These requirements apply in the case of male and female voters alike.

To meet the expenses of the Government, a number of special taxes were put into effect in 1920. Modifications were made on the luxury tax and other forms of taxation which had proved to be unpopular.

CANADA BALSAM, a pale balsam, resin, or oleoresin, obtained by incision from a Canadian tree, the American silver-fir, sometimes called the Balm of Gilead fir (*Abies balsamea*). Canada balsam is of the consistence of thin honey, drying slowly by exposure to the air into a transparent adhesive varnish. It is used to mount objects for the microscope and for other optical purposes.

CANADA GOOSE, an American wild goose 30 to 35 inches long, brownish above, lighter below, head, neck, bill,



CANADA GOOSE

and feet black, a white patch on the cheek; breeds in the N. of the continent, and migrates S. when the frost becomes severe.

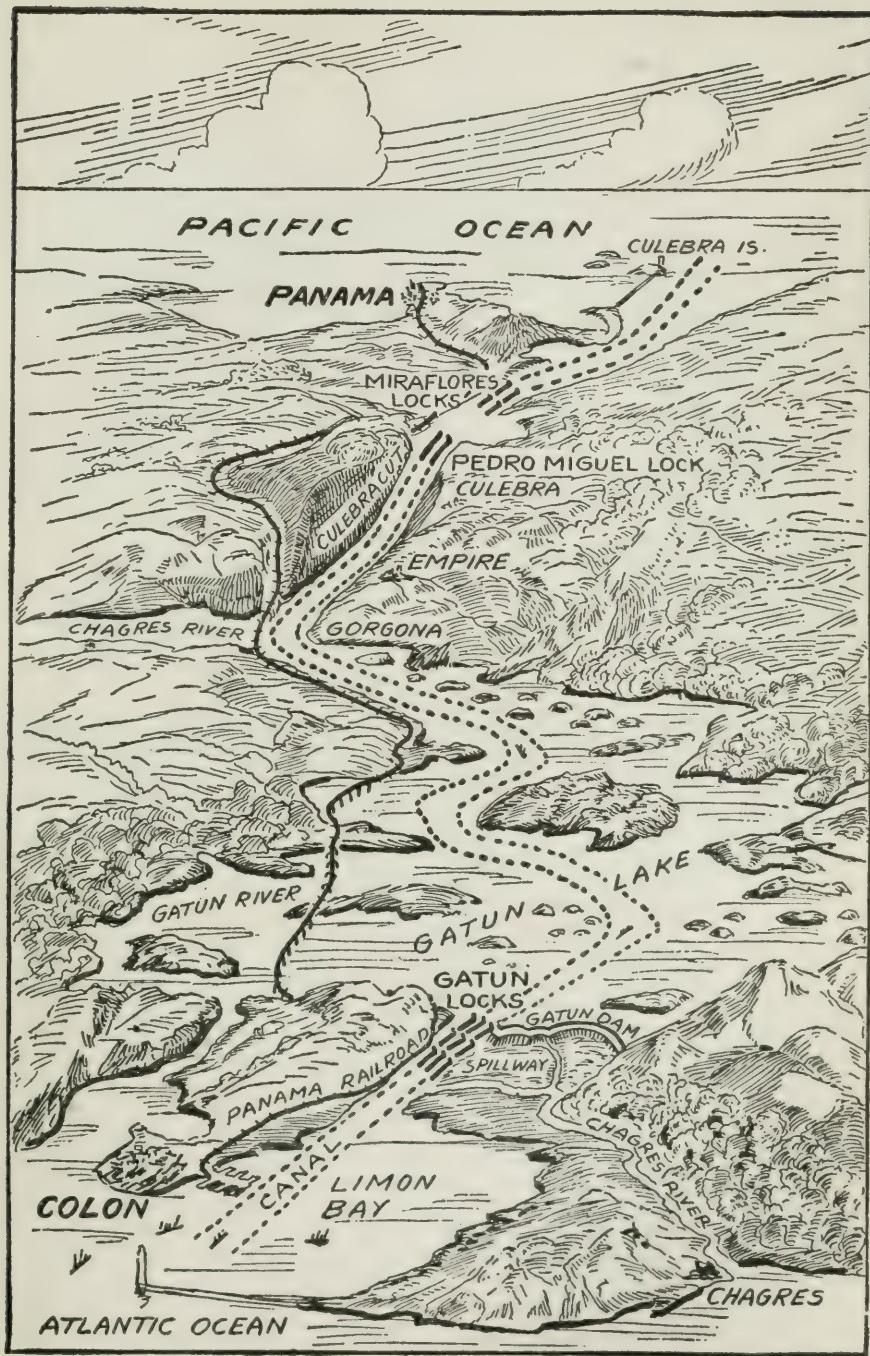
CANADA HEMP, a perennial herb, *apocynum cannabinum*, of the dogbane family, native of North America. It has a strong fiber, used by the Indians for twine, nets, woven fabrics, etc.

CANADIAN RIVER, a river that rises in the N. E. part of New Mexico, and runs generally E. through Texas and Indian Territory to the Arkansas. Its length is about 900 miles, but it is rather shallow and not important for navigation. Its largest tributary is the Rio Nutria, or North Fork of the Canadian, which runs parallel to the main stream for about 600 miles.

CANAL, an artificial water-course or channel, especially used for the passage of boats. The Egyptians very early made a canal connecting the Nile and the Red Sea. It was reopened by Pharaoh Necho about 605 B. C., and at intervals by others after him. Most of the ancient nations had canals. The great canal of China was constructed partly in the 7th and partly in the 9th century A. D.; it is 825 miles long. The first known English canal was cut by the Romans at Caerdike. The Trent and the Witham were joined in 1134, and the Bridgewater canal was commenced in 1759. The Caledonian canal was projected in 1803, but not opened till 1822. The Erie canal was begun in 1817 and completed in 1825. The Amsterdam, or Great North Holland canal, was completed in 1825. It is 125 feet wide at the water surface, 88 feet and 7 inches wide at the bottom, and has a depth of 20 feet; it extends from Amsterdam to the Helder, 51 miles. The Languedoc, or Canal du Midi, connecting the Atlantic with the Mediterranean, was completed in 1861; its length is 148 miles; it has more than 100 locks and about 50 aqueducts, and its highest part is 600 feet above the sea; it is navigable for vessels of upward of 600 tons. The Suez canal, connecting the Mediterranean and the Red Sea, was opened on Nov. 17, 1869. Its length is 99 miles, with a width of 327 feet for 77 miles, and 196 for the remaining 22 miles. Its depth is 26 feet. Its success suggested the project of cutting through the isthmus joining North and South America. This undertaking, begun by the renowned engineer of the Suez canal, M. de Lesseps, was, after a prosecution to a stage near completion, abandoned in 1892, as a result of a terrific scandal, in which nearly every functionary connected with the enterprise was involved. A number of them (including the venerable M. de Lesseps) were tried in France and convicted of bribery and misappropriation of funds, the result of the agitation being to shake

public confidence in the enterprise to a degree that rendered it impossible to raise money for its further continuance—for the time being at least. The great Manchester ship canal, extending from Eastham (the head of navigation of the Mersey river near Liverpool) to Manchester, England, was opened Jan. 1, 1894. The Corinth ship canal, across the Isthmus of Corinth, was opened by King George of Greece, Aug. 6, 1893. It is nearly four miles long, 80 feet 8½ inches wide, 24 feet 3 inches deep, and cost \$15,000,000. On June 20, 1895, the great Baltic and North Sea canal was opened by the German Emperor in the presence of a navy representing all nations. Work began on the great Chicago drainage canal Sept. 3, 1892, and by Jan. 1, 1900, it was completed. The main channel is 29 miles long, of which about nine miles was cut through solid rock 22 feet deep.

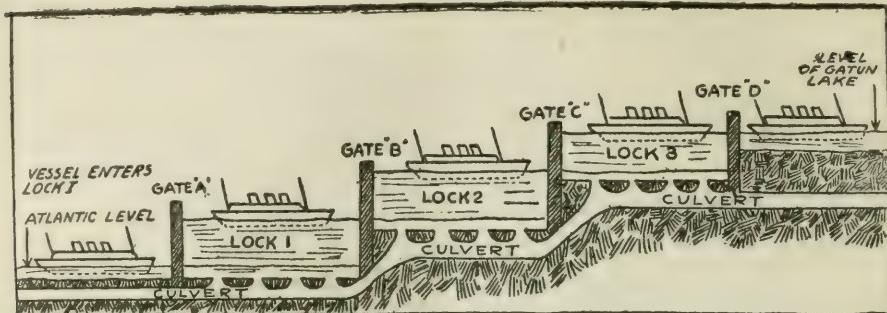
The Cape Cod canal is an artificial canal excavated across Cape Cod, connecting Buzzard's Bay with Barnstable Bay. It was practically completed in 1914. The canal cuts off about 70 miles in the distance traveled by steamers between New York and Boston. The canal was taken over by the United States Government on July 23, 1918, following an attack made by a German submarine on several coal barges passing through the canal. Considerable dredging was carried on in enlarging the canal during 1918. As a result vessels of 7,000 tons were able to pass through. Other important canals, either in process of construction or in contemplation in 1919, included a deep water-way to connect the Chicago Drainage canal with the Illinois river. The bill providing for this was passed by the Illinois Legislature. The fourth lock of the Sault Ste. Marie canal in Michigan was opened to traffic on Sept. 18, 1919. The construction of this lock greatly increased the facilities of this canal. The Sault Ste. Marie canal, although only one and one-third miles in length, was constructed at a cost of over \$4,000,000. Other notable canals in the United States are the Chesapeake and Ohio canal, 185 miles long, costing over \$11,000,000, and extending from Cumberland, Md., to Washington, D. C.; the Florida Coast Line canal, 370 miles long, costing \$3,500,000 and extending from Mayport, Fla., to Miami, Fla.; the Illinois and Michigan canal, 96 miles long, costing over \$6,000,000, and extending from Chicago to La Salle, Ill.; the Hennepin canal, 75 miles long, costing over \$7,000,000 and extending from the Illinois river to the Mississippi river near Rock Island, Ill.; the New Jersey Coastal Inland Waterway, 114 miles long, costing \$415,000, extending from Cape May



PANAMA CANAL

to Bay Head, N. J.; the Pennsylvania canal, 193 miles long, costing nearly \$8,000,000, and extending from Columbia

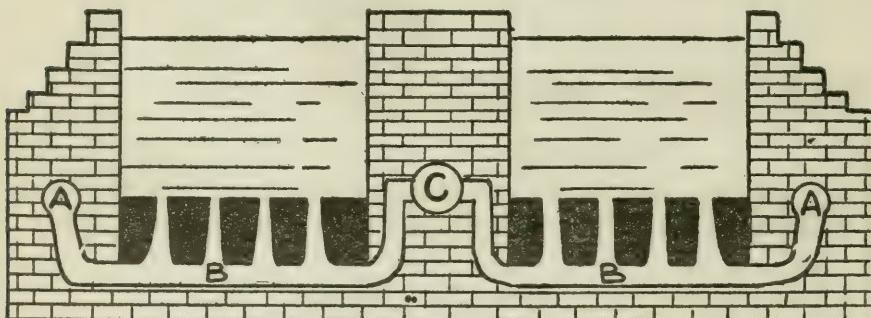
an extreme length of 15 miles, and a width of one mile. Its outlet is Seneca river.



GATUN LOCKS, PANAMA CANAL

to Northumberland and Wilkes-Barre, Pa.; and the Miami and Erie canal, 274 miles long, extending from Cincinnati to Toledo, O., and costing over \$8,000,000.

CANAR, a small province of Ecuador, between the provinces of Chimborazo and Azuay; capital, Uzogues. Pop. about 65,000.



CROSS SECTION OF LOCK CHAMBERS, PANAMA CANAL

A. Sidewall Culverts

B. Center Culverts

C. Lateral Culverts

For detailed account of the Panama canal, see PANAMA CANAL; and for New York Barge canal see that title.

CANANDAIGUA, village and county-seat of Ontario co., N. Y.; at the N. extremity of Canandaigua Lake; on the New York Central, and Pennsylvania railroads; 29 miles E. of Rochester. The site is elevated and commands a beautiful view of the lake, and has many handsome residences and churches, the Canandaigua Academy, private and public schools, National bank, several private banks, Ontario Orphan Asylum, insane asylum, a Catholic orphanage, several manufactories, and newspapers, etc. Pop. (1910) 7,217; (1920) 7,356.

CANANDAIGUA LAKE, a lake in western New York, 668 feet above the sea and 437 feet above Lake Ontario. It lies mostly in Ontario county and has

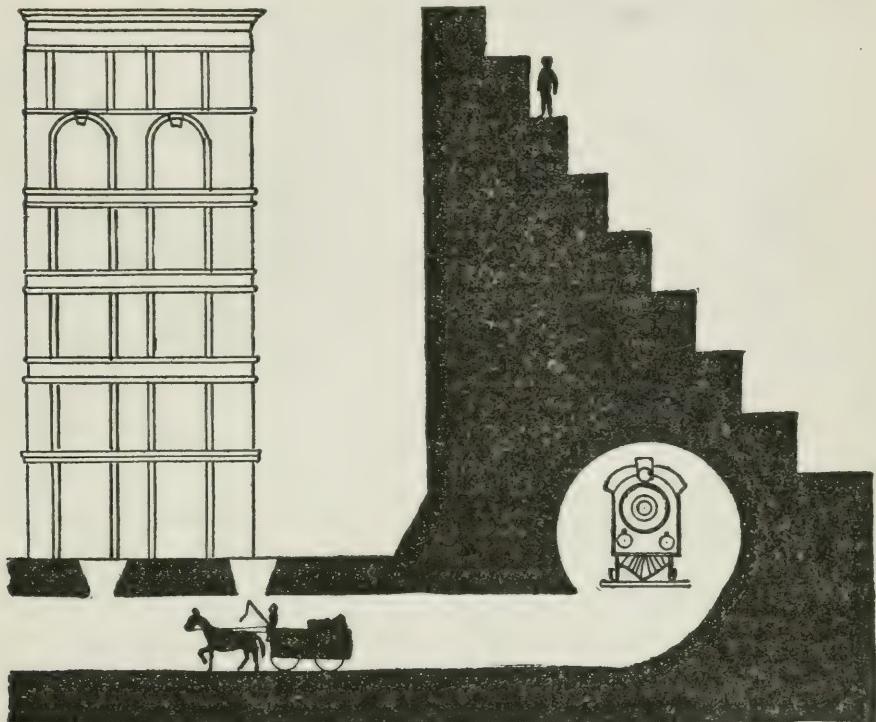
CANARD, a false report; a silly rumor. The word was coined from the French *canard*=a duck, and arose from the story of cannibalism among a flock of ducks, who ate one of their number each day until at last they were reduced to one individual, the survivor having thus, it was argued, eaten all his companions. The story was the "rage" in Paris for a time, and afterward when any marvelous recital was heard, the auditor would shrug his shoulders and exclaim, "C'est un canard!" (That's a canard, or duck!).

CANARY BIRD, an insessorial singing bird, a kind of finch from the Canary Islands, the *Carduelis Canaria* or *Fringilla Canaria*. They were introduced into Europe 300 or 400 years ago. A large proportion of the cage canaries are really mules, produced by the inter-

breeding of canaries with allied species, such as the goldfinch, siskin, linnet, bullfinch.

artificial channels for the purpose of irrigation.

TENERIFFE, the largest island of the



DIAGRAM, SHOWING HEIGHT OF LOCKS AND PROPORTIONS OF CONDUITS OF GATUN LOCKS, PANAMA CANAL

CANARY ISLANDS, a group of islands belonging to Spain in the Atlantic Ocean, off the N. W. coast of Africa, forming a Spanish province. The group consists of seven large and several small islets, with a joint area of about 3,342 square miles, and a population of about 500,000. The principal islands, proceeding from E. to W., are Lanzarote, Fuerteventura, Gran Canaria, Teneriffe, Gomera, Palma, and Hierro or Ferro. The distance from Fuerteventura to the African coast is about 62½ geographical miles. The coasts are steep and rocky, and the surface is diversified with high mountains, narrow gorges, and deep valleys. All the islands are volcanic, and everywhere show plain marks of their origin, in the shape of cones, craters, beds of tuff and pumice, and streams of lava; but eruptions have taken place within the historical period only in Teneriffe, Palma, and Lanzarote. There are no rivers, and on several of the islands water is very scarce. The springs on those better supplied are diverted by long

group, has an area of 877 square miles, with a population of 112,000. The chief town and port is Santa Cruz de Santiago, on the S. E. coast. It is the seat of the officials of the general government. The other towns are Laguna, a few miles from Santa Cruz, on a plain 1,800 feet above the sea; Puerto Orotava, on the N. coast; Villa Orotava, 1,060 feet higher; and Icod de los Vinos, near which the largest existing dragon-tree grows. The famous Peak of Teneriffe is in the N. W. of the island.

GRAN CANARIA, which is next in importance, has an area of 758 square miles, with a population of 80,000. Its culminating peak is El Cumbre, with a height of 6,648 feet. The capital, Las Palmas, on the E. coast, is the largest town of the archipelago. The surface of this island is so broken that only a small part is under cultivation. At Artinara, at a height of 3,850 feet, there is a village of caves, with a population of 1,100 persons. A few miles from Las Palmas is the cone of Vandama, 1,800 feet high,

with an extinct crater, circular and perfect, 800 feet deep.

PALMA, a classic spot for geologists, has an area of 718 square miles, and a population of 36,000. Its highest peak, Pico de los Muchachos, has an elevation of more than 7,600 feet. The ancient crater of the Caldera is of enormous size, though open to the sea on one side. Capital, Santa Cruz de las Palmas, on the E. coast.

The area and population of the other islands are as follows: LANZAROTE is 323 square miles, pop. 19,000; FUERTEVENTURA, 326 square miles, pop. 15,000; GOMERA, 169 square miles, pop. 13,000; HIERRO, 82 square miles, pop. 5,000. In former times the first meridian of longitude was commonly drawn through Hierro. The chief towns of these islands are small.

The Canaries are supposed to have been the Fortunate Islands of the ancients. The geographers of Greece and Rome were acquainted with their position, and King Juba's account of them has been preserved by the elder Pliny. For many centuries they were lost sight of, and not rediscovered until 1334, when a French vessel was driven among them by a storm. In 1402 the Norman Jean de Bethencourt fitted out an expedition for the purpose of subduing the islands, and in 1404, having obtained assistance from Spain, he succeeded in mastering four of them. His successor having sold his rights in Spain, they were afterward acquired by the King, who sent a large force in 1477 to conquer the Guanches, a brave and intelligent race of large stature, and comparatively fair. Their origin is unknown, but they are assumed by many to have been of Berber or Libyan stock. Their resistance was so stubborn that it was not until 1495 that the last of the islands was mastered. They have been ever since the property of Spain. The Guanches suffered terribly from their conquerors, and have long ceased to exist as a separate people; but in the local museums may be seen specimens of their mummies, skeletons, weapons, and pottery works. On Teneriffe is a wireless station for communication with Spain.

CANCAN, a dance, something of the nature of a quadrille, but accompanied by violent leaps and indecorous contortions of the body. The earlier and usual meaning of the word in French is noise, racket, scandal.

CANCER, "the Crab," the fourth of the 12 constellations of the zodiac. The constellation is one of Ptolemy's original 48, but contains no stars brighter than the fourth magnitude, hence it is some-

times called the Dark Constellation. Two of its stars, Gamma and Delta, are called Aselli, "The Little Asses," and between them is the cluster Præsepe, "The Crib," out of which they are feeding. Cancer is bounded by Lynx, Leo Minor, Leo, Hydra, Canis Minor, and Gemini. It lies entirely N. of the equator.

CANCER. To the pathologist cancer means a special form of malignant tumor of which the technical name is carcinoma. As commonly used, however, cancer indicates a malignant tumor of any form. The essential difference between a cancer and a so-called benign tumor, is that the former has a tendency to grow out into neighboring tissues by root-like projections, and finally to destroy the tissues themselves. The benign tumor injures its victim only because of its size or inconvenient location. It is not uncommon for benign tumors to take on cancerous properties. For this reason the surgeon advises that all tumors, all suspicious lumps, as one doctor phrases it, should be promptly cut out. Many cures are achieved by the surgeon, where the lump is extirpated while small. The larger and older it is, the less is the chance of curing the victim by surgery. In certain superficial cancerous growths, radium and the x-rays have proved useful; cures have been effected by their application. But when the malignant growth is deep-seated, or very active, no form of rays can, as a rule, stay its progress. Regarding the cause of cancer there is as yet no general agreement among experts. The latest experiments indicate that heredity has little part in causing it. The theory that cancer is caused by a germ is also rendered doubtful by modern research. The following summary from the last annual Report of the British Cancer Research Fund, will, perhaps, best indicate the present status of the cancer problem:

Spirochætas in Cancer.—These organisms claimed by several recent observers to be the true cancer germs, were found in mice not afflicted with cancer, and were not found in cancerous tissues, which leads the doctors of the Fund to conclude that Spirochæta has no causal relation to cancer—is not the long-sought cancer germ.

Heredity.—Experiments carried out with successive generations of mice, extending over five years, showed no tendency to the inheritance of cancer.

Immunity.—It was found possible by the use of inoculations to immunize mice against cancer from other mice. "These achievements must not be confounded," says the report, "with successful vaccination against spontaneous cancer arising."

As yet this has not been accomplished, but the prospect that it will be eventually is increased by the work above recorded. This would mean, apparently, routine vaccination for the prevention of cancer; possibly also a curative as well as a preventive vaccine. Just now this is the direction from which a cancer cure seems most likely to come.

Increase of Cancer.—Regarding the supposed great increase in the occurrence of cancer, the more conservative surgeons are skeptical. They believe that most of the apparent increase is due to (1) better diagnostic methods; that is, we recognize more tumors as cancers now than was the case formerly, and (2) the fact that more people live to the cancer age. (Cancer is particularly a disease of maturity and old age, although it occasionally occurs in young persons, and even children.) Among the most interesting discoveries of recent years in the cancer field is the fact that this disease is of very widespread occurrence in both the animal and vegetable world. Wild as well as domestic animals are heavy sufferers from its ravages.

The chief advance in the treatment of cancer in recent years has been in the employment of radium, which has proved to be an effective remedy. Applied to cancer in its early stages, radium has effected a valuable cure and is an advantage even in aggravated cases. It is the gamma ray which is applied to the cancerous growth. The alpha rays burn, and have to be screened off. The gamma rays destroy diseased tissue before they will attack sound tissue. The chief obstacle to the use of radium is its scarcity and expense. The State of New York in August, 1920, purchased 2 grams and one-quarter of radium for the free treatment of cancer and allied malignant diseases. This amount is sufficient to treat 2,000,000 patients.

CANCER ROOT, or BEECH DROPS (*Epiphegus virginiana*), a parasitic herb of the order Orobanchæ, a native of North America, growing on the exposed roots of beech-trees. The whole plant is powerfully astringent, and the root is especially bitter and nauseous. In conjunction with arsenious acid, it is believed to have formed a medicine once famous in North America under the name of Martin's Cancer-powder. Another American plant of the same order, *Phelipæa biflora*, sometimes shares the same name and repute in popular medicine; and an infusion of the Common Broomrape (*Orobanche major*)—a native of Great Britain and of the S. of Europe, parasitic on the roots of broom, furze, and other leguminous plants—has

been employed as a detergent application to foul sores.

CANDACE, a name apparently common to the warrior queens of Ethiopia, i. e., upper Nubia, between the Nile and the Atbara, in the later period of the Kingdom of Meroë. The most distinguished of them invaded Egypt 22 B. C., was defeated by the Romans and obliged to sue for peace, which she obtained, with a remission of the tribute imposed on her by Petronius.

CANDIA. See CRETE.

CANDIDATE, a term taken from the Latin *candidatus*, a candidate, literally a person dressed in white, because, among the Romans, a man who solicited an office, such as the prætorship or consulship, appeared in a bright white garment—*toga candida*.

CANDLE, a light made of a wick of cotton or other material enveloped in prepared wax or tallow. Candles are primarily divided into dipped or mold candles, sometimes called dips and molds, according to the method of their manufacture. Named from the materials employed in their construction, they are paraffine, spermaceti, composition, stearine, tallow, palm-oil, or wax candles.

CANDLEBERRY (*Myrica cerifera*), a shrub, natural order Myricæ, growing from 4 to 18 feet high, and common in North America, where candles are made from its drupes or berries, which are about the size of peppercorns, and covered with a greenish-white wax, popularly known as Blayberry tallow. The wax is collected by boiling the drupes in water and skimming off the surface. A bushel of berries yields from four to five pounds of wax. Another plant belonging to the same genus is the sweet-gale (*Myrica Gale*), which grows abundantly in bogs and marshes in Scotland—a small shrub, with leaves somewhat like the myrtle or willow, of a fragrant odor and bitter taste, and yielding an essential oil by distillation.

CANDLE FISH, a small fish peculiar to the Pacific coast of the United States. It is so oily that when dried and a wick is drawn through it, it will burn like a candle. It is allied to the Smelt family.

CANDLEMAS, the feast of the Purification of the Blessed Virgin, Feb. 2; so-called from being formerly celebrated with processions and shows of candles. It was instituted in the 6th century, during the reign of Justinian, and came in lieu of the Roman festival of Lupercalia, which had been also celebrated in the month of February, and with candles.

GANDY, or KANDY, a city of Ceylon, near the center of the island, 72 miles N. E. of Colombo (with which it is connected by railway), in a fertile valley surrounded by finely wooded hills. The residence of the governor at the N. E. extremity is among the finest structures in Ceylon. Other noteworthy places are the Buddhist temple, called "the palace of the tooth," the old royal cemetery, the military magazine in the center of a lake, the government brick-works, etc. Pop. about 30,000.

CANDYTUFT, the popular name of several flowers of the genus *Iberis*, order Cruciferæ, common in gardens: said to be named from Candia.

CANE, or KEN, a river in Bundelkhand, India, a tributary of the Jumna river. It follows a N. E. course and is about 250 miles in length. In its upper region is an important reservoir.

CANEA (Greek *Khania*), the capital and chief commercial town of Crete, situated on the N. W. coast, with a fine harbor. It occupies the site of the ancient Cydonia, but the present town is due to the Venetians, from whom it was wrested by the Turks after a two years' siege in 1669. Canea is the principal center for exporting the productions of the island. Pop. about 25,000. See CRETE.

CANE BRAKE (*Ludolfia* (*Arundinaria*) *macrospurma*), a colossal reed, nearly allied to the bamboo, which reaches a height of 30 or 40 feet, and forms dense swamp-jungles (sometimes of wide area) in marshy places, and along the banks of the Red river, the Arkansas, the Mississippi, and their tributaries.

CANES VENATICI (Latin "the Hunting-dogs," Asterion and Chara), one of the northern constellations added by Hevelius in 1690, between Boötes and Ursa Major. On the maps, the two dogs, Asterion and Chara, are represented as held in leash by Boötes, and pursuing Ursa Major, and the celestial pole.

CANFIELD, JAMES HULME, an American educator; born in Delaware, O., March 18, 1847; spent his early life on a New England farm; was graduated at Williams College in 1868. In 1872 he was admitted to the bar, and practiced in St. Joseph, Mich., until 1877; in 1877-1891 he was Professor of History in the University of Kansas; and in 1891-1895 was Chancellor of the institution. He then became President of the Ohio State University. He was secretary and president of the National Education Association, and in 1899 became librarian of

Columbia University. He died March 30, 1909.

CANG, CANGUE, or KEA, the wooden collar, weighing from 50 to 60 pounds, and fitting closely round the neck, imposed upon criminals in China.

CANICATTI, a town in Sicily, province of Girgenti, well built, and with a population of about 30,000, mostly engaged in agriculture.

CANICULA, the dog-star or Sirius; hence Canicular days, the dog-days.

CANIDÆ, a family of mammals belonging to the order Carnivora, and the section Digitigrada. The muzzle is more or less pointed, the tongue smooth, and the claws non-retractile, the last-named character distinguishing it from the Felidæ. The fore feet have five toes each, and the hind ones four. It contains the dogs, wolves, foxes, and jackals. It is akin to the Hyænidæ. Canidæ have been found in the Eocene, but this may not have been the first appearance of the family in geological time. There are fossil as well as recent genera known.

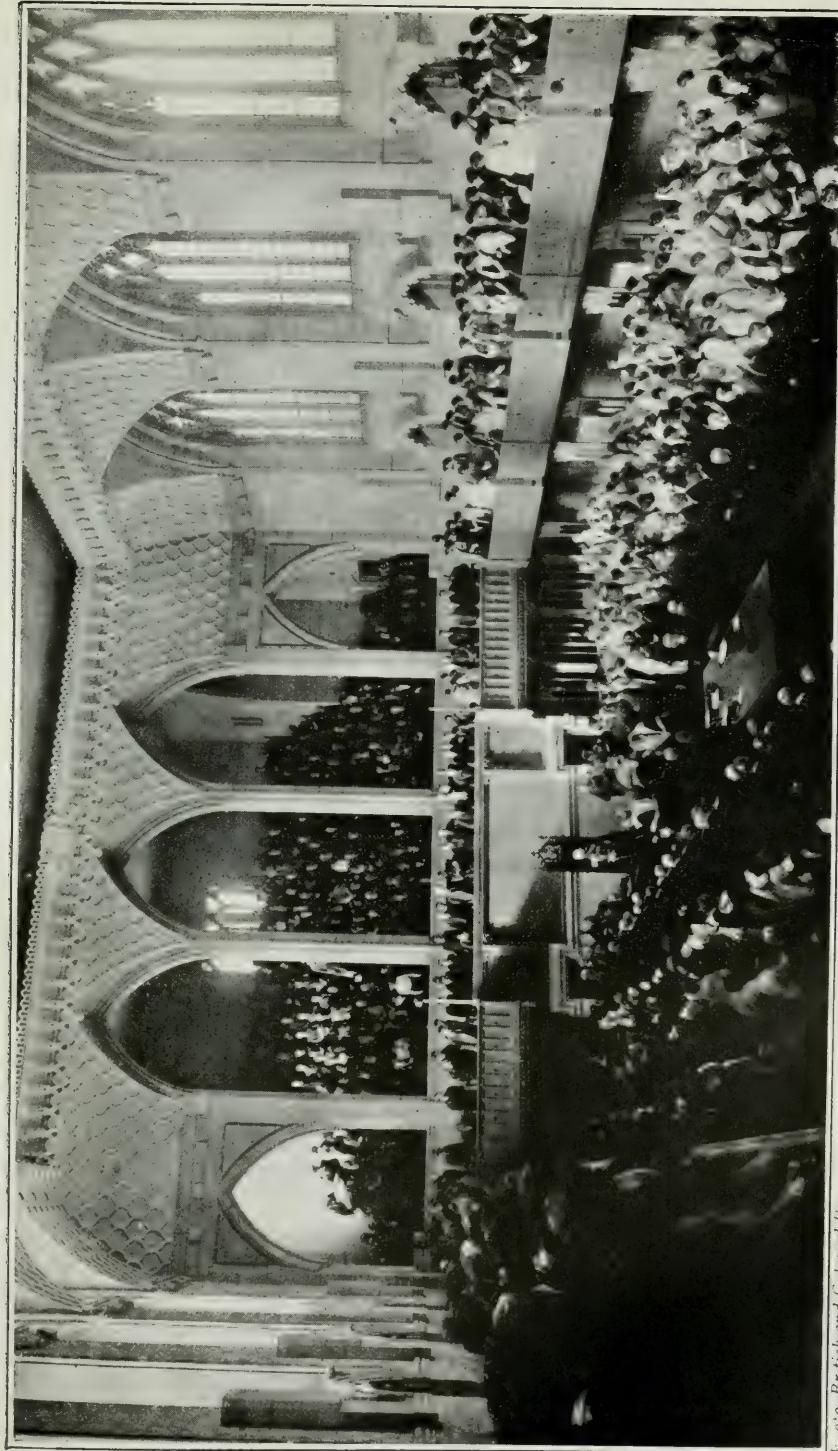
CANIGON (kä-nē-gon'), one of the peaks of the Pyrenees in France. It is in the department Pyrénées-Orientales, 24 miles from Perpignan; height, 9,137 feet.

CANINA, LUIGI (kä-nē'nä), an Italian architect; born in Casale, Piedmont, Oct. 23, 1795; was for some time Professor of Architecture at Turin, and afterward lived in Rome, where he published works of great value on the antiquities of Rome, Veii, Etruria, and Tuscum. He died in Florence, Oct. 17, 1856.

CANINDE (kä-nēn'dā), a river of Brazil, flowing into the Parnahiba; length, 200 miles.

CANIS MAJOR ("the greater dog"), a constellation of the Southern hemisphere, remarkable as containing *Sirius*, the brightest star.—**CANIS MINOR** ("the lesser dog") is a constellation in the Northern hemisphere, immediately above Canis Major, the chief star in which is *Procyon*.

CANKER, (1) in medicine, a collection of small sloughing ulcers in the mouth, especially of children; called also water canker. (2) In horticulture, a kind of gangrenous disease to which fruit-trees especially are liable, beginning in the younger shoots and gradually extending to the trunk. (3) In farriery, a disease in horses' feet causing a discharge of fetid matter from the cleft in the middle of the frog, generally originating in a diseased thrush.



F.o.o, British and Colonial Press

OPENING OF THE CANADIAN PARLIAMENT IN THE NEW PARLIAMENT BUILDING AT OTTAWA, FEBRUARY 26, 1920



©Courtesy Canadian Pacific

LAKES-IN-THE-CLOUDS, AT DIFFERENT LEVELS, CANADIAN ROCKIES



©Courtesy Canadian Pacific

ROCK FORMATIONS CALLED "HOODOOS," NEAR THE BOW RIVER AND MT. RUNDLE,
CANADIAN ROCKIES



©Courtesy Canadian Pacific

THE "THREE SISTERS," NEAR BANFF, CANADIAN ROCKIES



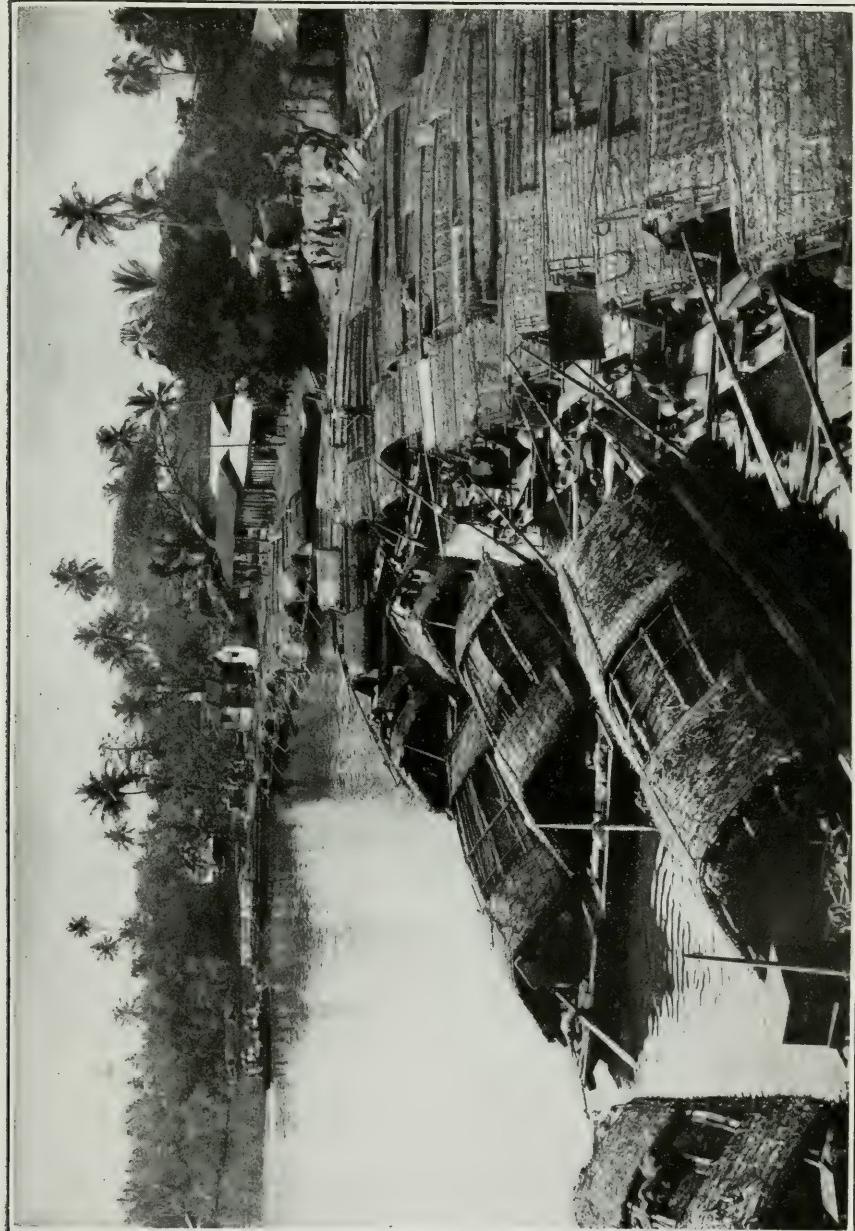
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A "HOODOO" OF THE RED DEER RIVER DISTRICT



THE HARBOR OF COLOMBO, ISLAND OF CEYLON

© Publishers' Photo Service



HOUSEBOATS AT COLOMBO, CEYLON

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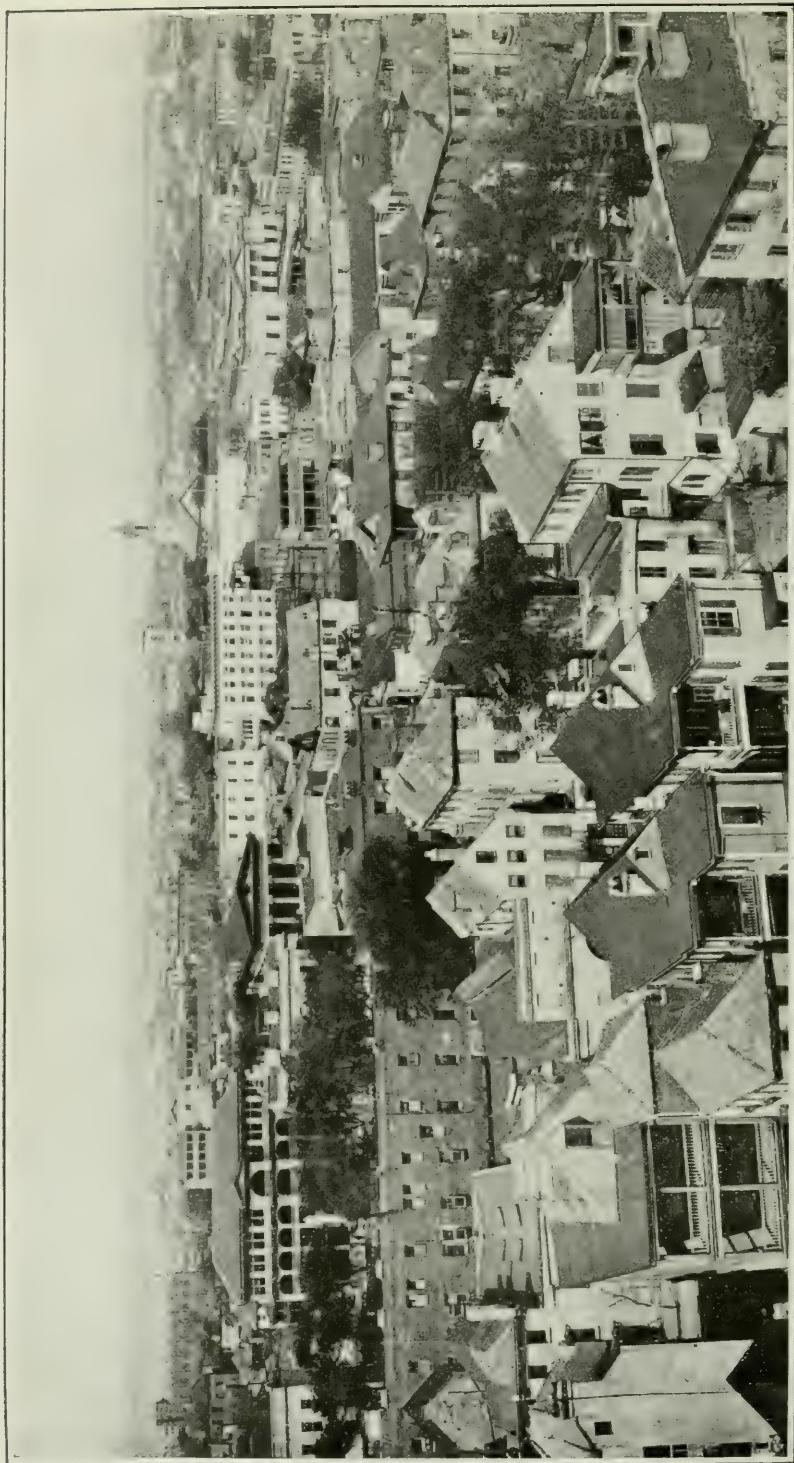


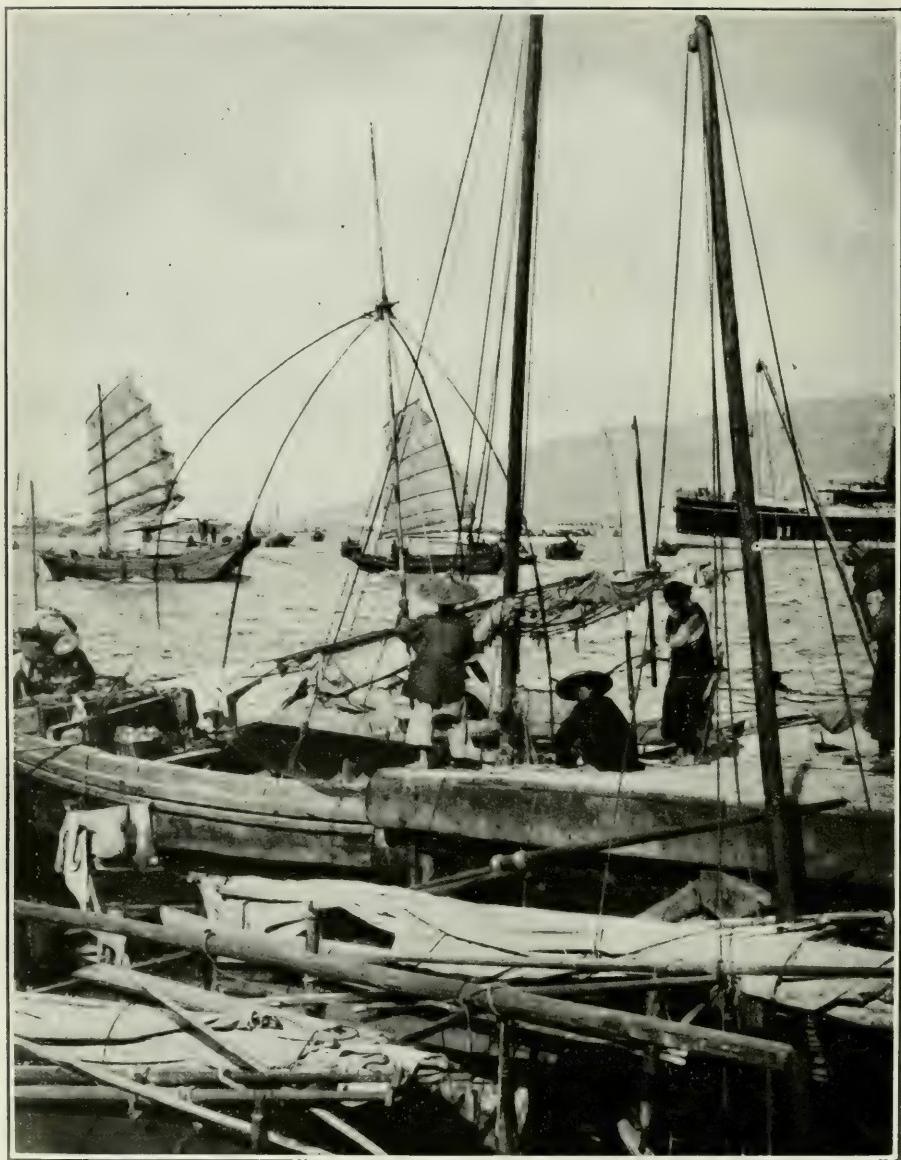
Photo by Ewing Galloway

CHARLESTON, S. C., A CITY IMPORTANT AS A SEAPORT AND INTERESTING FOR ITS HISTORY AND ARCHITECTURE



©Ewing Galloway

ADAMS STREET, CHICAGO, LOOKING TOWARD THE INSTITUTE OF ART



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A HARBOR SCENE IN THE CITY OF CANTON, CHINA, ON THE PEARL RIVER

CANKERWORM, a worm or larva destructive to trees or plants; in America specifically applied to moths and larvæ of the genus *Anisopteryx*.

CANNA, one of the Argyllshire Hebrides, 12 miles S. W. of Syke, and 3 N. W. of Rum. It is 4½ miles long, 1 mile broad, and 4½ square miles in area. The surface, nowhere higher than 800 feet, consists of trap.

CANNA, a genus of plants belonging to the endogenous order Marantaceæ. They have beautiful red or yellow flowers. *Canna indica* is the Indian shot or Indian bead, a native of Asia, Africa, and America; it is common and in flower most of the year in Indian gardens. The seeds have been used as a substitute for coffee, and they moreover furnish a beautiful but not a durable purple. A kind of arrowroot is extracted in the West Indies from a species believed to be *C. Achiras*. The fleshy corms of some cannas are said to be eaten in Peru, and, according to Von Martius, those of *C. aurantiaca glauca* and others are diuretic and diaphoretic, acting like orris-root.

CANNABINACEÆ, hempworts, an order of plants of the Urtical alliance. They have a solitary suspended ovule, and a hooked exaluminous embryo with a superior radicle. They inhabit the temperate parts of the Eastern hemisphere. Only two genera are known, *Cannabis*, or Hemp, and *Humulus*, or Hop.

CANNÆ, a town of southern Italy, province of Bari, near the mouth of the Ofanto, formerly the Aufidus, famous as the scene of the great battle in which the Romans were defeated by Hannibal (216 B. C.) with immense slaughter.

CANNEL COAL, a variety of bituminous coal, which differs from the purer kinds of ordinary coal, and jet, in containing extraneous earthy matters, which render it specifically heavier than water. It varies much in appearance, but is generally of a brown or black color, with a dull earthy to a brilliant waxy luster. It is very dense and compact, and not easily frangible, breaking with an uneven or largely conchoidal fracture, and does not soil the fingers. When burning, it splits and crackles, without melting, and leaves 3 or 4 per cent. of ash.

CANNES (kän), a seaport of France, on the shore of the Mediterranean, in the department of Alpes-Maritimes; famous as a winter residence, and as the place where Napoleon landed when he returned from Elba, March 1, 1815. Pop. about 30,000.

CANNIBALISM, the act or practice of eating human flesh by mankind; anthropophagy.

CANNING, CHARLES JOHN, EARL, an English statesman, son of George Canning; born Dec. 14, 1812; educated at Eton and Oxford. In 1841 he was appointed Under-Secretary of State for Foreign Affairs in Peel's government, and in 1846 Commissioner of Woods and Forests. In the Aberdeen ministry of 1853, and under Palmerston in 1855, he held the postmaster-generalship, and in 1856 went out to India as Governor-General. Throughout the mutiny he showed a fine coolness and clear-headedness, and though his carefully pondered decisions were sometimes lacking in promptness, yet his admirable moderation did much to re-establish the British Empire in India. He was raised to the rank of Earl and made Viceroy, but returned to England with shattered health, and died in London, June 17, 1862.

CANNING, GEORGE, an English orator and statesman; born in London, April 11, 1770; educated at Eton and at Oxford. He was first brought into Parliament by Pitt in 1793, and in 1796 became Under-Secretary of State. In 1797 he projected, with some friends, the "Anti-Jacobin," of which Gifford was appointed editor, and to which Canning contributed the "Knife-grinder" and other poems and articles. In 1798 he supported Wilberforce's motion for the abolition of the slave-trade. In 1807 he was appointed Secretary of State for Foreign Affairs in the Portland administration, and was slightly wounded in a duel with Lord Castlereagh, arising out of the dispute which occasioned the dissolution of the ministry. In 1814 he was appointed Minister to Portugal, and remained abroad about two years. He refused to take any part in the proceedings against the Queen, and in 1822, having been nominated Governor-General of India, he was on the point of embarking when the death of Castlereagh called him to the Cabinet as foreign Secretary. One of his earliest acts in this situation was to check the French influence in Spain. He continued to support the propositions in favor of Catholic emancipation, arranged the triple alliance for the preservation of Greece, but opposed parliamentary reform and the Test and Corporation Acts. April 12, 1827, his appointment to be Prime Minister was announced. On all the leading political questions of his day, with two exceptions—the emancipation of the Catholics and the recognition of the South American republics—he took the high Tory side. He died in Chiswick, Aug. 8, 1827.

CANNON, ANNIE JUMP, an American astronomer, born in Dover, Del., in 1863. She received her education at Wellesley College. In 1897 she became a staff assistant in the observatory of Harvard College and was made curator of astronomical photographs. She achieved a reputation as an observer and cataloguer, having discovered three new stars and 150 variable stars, besides a spectroscopic binary. She was the author of an extensive bibliography of variable stars. Among her publications are "Second Catalogue of Variable Stars" (1907); "Maxima and Minima of Variable Stars of Long Period" (1909); and "William Parsons Fleming" (1911).

CANNON, JOSEPH GURNEY, an American public official, born in Guilford, N. C., in 1836. He was educated in the public schools and after studying law was admitted to the Illinois bar in 1858. From 1861 to 1868 he was State's attorney of the 27th Judicial District of Illinois. He was elected to the 43d Congress in 1873, and was re-elected to successive Congresses until 1891, when he was defeated. From 1893 to 1913 he was successively re-elected and was defeated again in 1914, but was successful in the election of 1915. He was also re-elected in 1917 and in 1919. He was chairman of the Committee on Appropriations in the 51st, 55th, 56th, and 57th Congresses, and was speaker of the House in the 58th, 59th, 60th, and 61st Congresses. In this position he became one of the most prominent political figures in the country. He also had a large part in the formation of the most important legislation passed during his period of office. He was the oldest member of the House of Representatives in the point of years of service. In the Republican National Convention of 1908 he received 58 votes for the presidential nomination. He was a frequent contributor to magazines on political subjects.

CANNON-BALL TREE, a name given to a South American tree—*Couroupita guianensis*—from the large size and globular shape of its fruit. It belongs to the order *Lecythidaceæ*. The fruit is vinous and pleasant when fresh, but emits an intolerably offensive odor when in a state of decay. It is known in Cayenne as the "Abricot Sauvage," i. e., Wild Apricot. The shells are used as drinking utensils; the seeds are eaten by monkeys.

CANOE, a boat made of a hollow trunk of a tree, or of the bark shaped and strengthened. Canoes have been made large enough to carry 20 or 30 hogsheads of sugar. Some have decks,

and carry sail; but they are generally open boats, propelled by paddles. They are seldom wide enough for two men to sit abreast, but vary greatly in length. Greenland Canoes, or kayaks, are often made of light wooden frames covered with sealskins, which are also drawn across as a deck, with only a hole left for one man to sit in it. In recent years there has been a new and extensive use and development of the craft. There are many Canoe clubs in the United States and in England, and the Canoe may be seen on all the coast-wise and inland waters of the United States and Canada.

CANON, in its original sense, a cane or reed used as a measure or rule. Specifically, a law or rule in general.

In ecclesiastical history a canon is a book containing the rules of a religious order used in monastic institutions. A list or catalogue of the canonized saints of the Roman Catholic Church. A dignitary of the Church; one who possesses a prebend, or revenue allotted for the performance of divine service in a cathedral or collegiate church. The order of regular canons of St. Augustine was spared at the time of the Reformation, and it continues in the Anglican Church to the present day. They are still nominally what they once actually were—the council of the bishop for the administration of the affairs of his diocese—and they constitute the chapter of the body known as the Dean and Chapter.

In music a Canon is a vocal composition consisting of two, three, or four parts, in which the several voices begin at fixed intervals consecutively; sometimes each voice commences with the same, sometimes with different notes.

In printing a canon is a kind of large type principally used in posting bills. It was used for printing the canons of the Church, whence its name.

CAÑON (kan'yon), the Spanish word for tube, funnel, cannon; applied by the Spanish Americans, and hence in North America generally, to long and narrow river gorges or deep ravines with precipitous and almost perpendicular sides, occurring frequently in the Rocky Mountains, the Sierra Nevada, and great western plateaus of North America.

CANONESS, a lady holding a similar position to a canon. Canonesses still exist in Germany.

CANONICAL BOOKS, the books of Scripture belonging to the canon.

CANONICAL HOURS, certain stated times of the day appropriated by ecclesiastical law to the offices of prayer and devotion in the Roman Catholic Church,

viz., matins with lauds, prime, tierce, sext, nones, even-song or vespers, and compline.

CANONICALS, the dress or vestments of the clergy.

CANONIZATION, a ceremony in the Roman Church, by which deceased persons are declared saints. The Pope institutes a formal investigation of the miraculous and other qualifications of the deceased person recommended for canonization; and an advocate of the devil, as he is called, is appointed to assail the memory of the candidate. If the examination is satisfactory, the Pope pronounces the beatification of the candidate, the actual canonization generally taking place some years afterward, when a day is dedicated to his honor, his name inserted in the canon or Litany of the Saints in the Mass, and his remains preserved as holy relics.

CANON-LAW, the body of ecclesiastical law as laid down by the canons.

CANONSBURG, a borough of Washington co., Pa., on the Pittsburgh, Cincinnati, Chicago, and St. Louis railroad. It is in the center of an important coal-mining region and has manufactures of pottery, tin plate, steel, stoves, iron, stove pipes, etc. It is the seat of the Pennsylvania Training School, the Washington and Jefferson College, and other institutions. Pop. (1910) 3,891; (1920) 10,632.

CANOPIC VASES, vessels found in Egypt, which were placed in tombs, and contained the embalmed intestines of the dead.

CANOPUS, an ancient Egyptian city, between Alexandria and the western mouth of the Nile, once the chief harbor of the Delta. It had a popular temple of Serapis.

CANOPUS, or **CANOBUS**, a bright star of the first magnitude, belonging to the Southern constellation Argo, and invisible in the North or Middle parts of the United States, on account of its nearness to the South Pole.

CANOSA (kan-ō'sa), (ancient Canusium), a town of southern Italy, Bari, near the Ofanto, 15 miles S. W. of Barletta. The old city, said to have been founded by Diomed, or in a period antecedent to the records of Roman history, was in ancient times one of the most considerable cities in this part of Italy for extent, population, and magnificence. It reached the acme of its prosperity under Trajan. It was reduced to its present condition by a series of disasters inflicted on it by the Goths, Saracens, and Normans. Pop. about 25,000.

CANOSSA (kan-os'ä), a ruined castle near Reggio, Italy, interesting for its historical associations. The Emperor Henry IV., excommunicated by Gregory VII., humbly waited for three days in its courtyard bareheaded, barefooted, and fasting, until the Pope reversed his decision.

CANOVA, ANTONIO (ka-nō'va), an Italian sculptor, born in Possagno, Nov. 1, 1757. He was first an apprentice to a statuary in Bassano, from whom he went to the Academy of Venice, where he had a brilliant career. In 1779 he was sent by the senate of Venice to Rome, and there produced his Theseus and the Slain Minotaur. In 1783 Canova undertook the execution of the tomb of Pope Clement XIV. in the Church of the Apostles, a work in the Bernini manner, and inferior to his second public monument, the tomb of Pope Clement XIII. (1792), in St. Peter's. From 1783 his fame rapidly increased. He established a school for the benefit of young Venetians, and among other works produced his group of "Venus and Adonis," the "Psyche and Butterfly," a "Repentant Magdalene," the well-known "Hebe," the colossal "Hercules hurling Lichas into the Sea," the "Pugilists," and the group of "Cupid and Psyche." In 1796 and 1797 Canova finished the model of the celebrated tomb of the Archduchess Christina of Austria, and in 1797 made the colossal model of a statue of the King of Naples executed in marble in 1803. He afterward executed in Rome his "Perseus with the Head of Medusa," which, when the "Belvidere Apollo" was carried to France, was thought not unworthy of its place and pedestal. In 1802 he was invited by Bonaparte to Paris to make the model of his colossal statue. Among the later works of the artist are a colossal Washington, the tombs of the Cardinal of York and of Pius VII.; a "Venus Rising from the Bath"; the colossal group of "Theseus Killing the Minotaur"; the tomb of Alieri; the "Graces Rising from the Bath"; a "Dancing Girl"; a colossal "Hector"; a "Paris"; a "Mars and Venus," etc. After the second fall of Napoleon, in 1815, Canova was commissioned by the Pope to demand the restoration of the works of art carried from Rome. He went from Paris to London, and returned to Rome in 1816, where he was made Marquis of Ischia, with a pension of 3,000 scudi. He died in Venice, Oct. 13, 1822.

CANOVAS DEL CASTILLO, ANTONIO (kā'nō-väs del kä-s té'yō), a Spanish statesman and man of letters; born in Malaga, Feb. 8, 1826; was editor

of the Conservative journal "Patria," and in 1854 entered the public service as member of the Cortes; thereafter he held various posts in the government. At his death he had been for some years prime minister. He was editor-in-chief of a "General History of Spain," consisting of monographs by sundry writers, of which the first volume appeared in 1890. He was assassinated at the baths of Santa Aqueda, Aug. 8, 1897.

CANROBERT, FRANCOIS CERTAIN (kän-rö-bär'), Marshal of France, born at St. Cére in Lot, June 27, 1809, studied in the military academy of St. Cyr, and in 1828 entered the army. He had seen close upon 20 years' brilliant service in Algeria, and had actively supported the future emperor at the *coup d'état* of 1851, when in January, 1853, he received the rank of a general of division. As such he commanded the first division of the French army under Marshal St. Arnaud, sent to the Crimea in 1854; and at the battle of the Alma was wounded in the breast and hand by the splinter of a shell. On St. Arnaud's death, nine days later, Canrobert assumed the chief command of the French army. In the war in Italy against the Austrians (1859) Canrobert had the command of the third division of the French army, and fought at the battles of Magenta and Solferino. In the Franco-German war of 1870 he was shut up in Metz with Bazaine, and became a prisoner in Germany. He was an ardent Imperialist till the death of the Prince Imperial (1879). In 1876 he became a member of the Senate. He died Jan. 28, 1895.

CANSO, CAPE, the E. extremity of Nova Scotia, at the entrance of Chedabucto Bay. Canso Strait, a passage 17 miles in length and $2\frac{1}{2}$ in average breadth, separates Nova Scotia from the island of Cape Breton.

CANTABILE (kan-tab'i-le), in music, a term applied to movements intended to be performed in a graceful, elegant, and melodious style.

CANTABRI, the rudest and most valiant of all the old Iberian tribes anciently inhabiting the N. mountains of Spain.

CANTABRIAN MOUNTAINS, the general name of the various mountain ranges extending from the western Pyrenees along the N. coast of Spain to Cape Finisterre.

CANTACUZENUS (kan-ta-kö-zé'nus), a Greek princely family. (1) JOHANNES CANTACUZENUS was a noted soldier and statesman of the Byzantine empire in the reigns of Andronicus II. and III.,

the latter of whom in 1341 left him guardian and prime minister of his son, Johannes V., then nine years old. Cantacuzenus, however, proclaimed himself the child's colleague, Oct. 26, 1341, and after a five years' civil war secured his recognition, as well as the marriage of one daughter to the young emperor, and of another to the Sultan Orchan, whose help had been necessary to him. A second war, during which the Turks occupied Gallipoli, caused his retirement in 1355 to a monastery, where he died in 1383. (2) MATTHIAS, his son, was also made a colleague in the empire in 1353, and on his father's abdication began a war which ended two years later in his own deposition. He, too, died in 1383. (3) His brother MANUEL (died 1380) was governor of Peloponnesus from 1348, and was recognized as despot of Misithra by Johannes V.; he did much to encourage the immigration of the Albanians into the depopulated Morea. The family was notable among the Fanatics, and in later years a Russian branch supplied several brave and successful leaders to the cause of Greek independence.

CANTAL, a central department in France, area 2,217 square miles; capital, Aurillac. This department, formerly part of upper Auvergne, is named from its highest mountain, the Plomb du Cantal, 6,094 feet in height. The greater part of it, occupied by the Cantal mountains and highlands, furnishes only timber, archil, and pasture. It is watered by numerous rivers, the principal of which are the Dordogne, Cère, and Lot. The principal crops are rye, buckwheat, potatoes, chestnuts, hemp, and flax. Cattle, sheep, pigs, horses, and mules are reared in large numbers. Large quantities of cheese ("Auvergne cheese") are made. Hot mineral springs are abundant. Pop. about 225,000.

CANTATA, a poem or dramatic composition set to music, with solos and choruses. A cantata consisted originally of a mixture of recitative and melody, and was given to a single voice, but the introduction of choruses altered the first character of the cantata, and gave rise to some confusion in the manner of describing it.

CANTEEN, in military language, a regimental establishment managed by a committee of officers, in barracks or forts, for the sale of liquors, tobacco, groceries, etc., to the soldiers at reasonable prices. The profits are employed for the benefit of the soldiers themselves. In the United States the official term used now is *post exchange*. In 1901

Congress passed a law forbidding the sale of liquors in post exchanges. The word is also applied to a flat can or metallic bottle used by soldiers for carrying drinking water.

CANTERBURY, a city and parliamentary and municipal borough of England in Kent, 62 miles S. E. of London, giving name to an archiepiscopal see, the occupant of which is primate of all England. The Roman name was Durovernum, and the place was of early importance. Its present name is a modification of the Saxon Cant-wara-byrig,

cathedral. The city is beautifully situated in a fertile vale, on the river Stour. Small portions of the old walls and one of the old gates still remain. The cathedral, one of the finest ecclesiastical structures in England, 530 feet in length and 154 in breadth, has been built in different ages, the oldest part dating from about 1174. The great tower, 235 feet in height, is a splendid specimen of the Pointed style. Other ecclesiastical buildings are St. Augustine's monastery, now a church missionary college, St. Margaret's church, and the church dedicated to St. Martin, believed to be one



CANTERBURY CATHEDRAL

the Kentishmen's city. The foundation of the archiepiscopal see took place soon after the arrival of St. Augustine in 596. In the 8th, 9th, 10th, and 11th centuries the city was dreadfully ravaged by the Danes, but at the Conquest its buildings exceeded in extent those of London. The ecclesiastical importance of the place was consummated by the murder of Thomas à Becket in the cathedral, the priory and see benefiting by the offerings of devotees and pilgrims at his shrine. Henry VIII. dissolved the priory in 1539, and ordered the bones of Becket to be burned; and the troopers of Oliver Cromwell made a stable of the

of the oldest existing Christian churches. The old archiepiscopal palace is now represented by a mere fragment, and the archbishops have long resided at Lambeth. Canterbury has a royal grammar-school, founded by Henry VIII., numerous other schools, art gallery, etc. There are breweries and malting establishments; and the principal articles of trade are corn and hops. There are extensive barracks for cavalry and infantry. Pop. about 25,000.

CANTERBURY, a district occupying most of the center of South Island, New Zealand, with a coast line of 200 miles,

and a greatest breadth of about 150 miles. The W. part is traversed by mountains, from which a fertile plain of 2,500,000 acres slopes gradually down to the sea. Banks' Peninsula is a projection on the E. coast, consisting of an assemblage of densely-wooded hills, and containing several harbors. The famous "Canterbury Plains," extending along the coast, are admirably adapted for agriculture, while the interior is fine pastoral country, though, except near the highlands, very destitute of trees. It has considerable mineral resources. The chief places in the province are Christchurch, the capital; and Lyttelton, the port town, 8 miles from Christchurch. Area, 13,858 square miles. Pop. about 200,000.

CANTERBURY-BELL, a name given to species of *Campanula*, *C. medium* and *C. trachelium*.

CANTHARIS (pl. can-thar'-i-des), the Spanish-fly or Blister Beetle-fly, *Cantharis vesicatoria*, a coleopterous insect, the typical one of the family *Cantharidae*. They are collected principally in Hungary, Russia, and the south of France, and are imported in cases of 100 to 175 pounds weight. In several parts of England they have become so naturalized as to be almost native. They are about eight lines long; the elytra are a fine green color. They have a disagreeable odor and a burning taste, and contain a crystalline substance, Cantharidine.

The insects described above are externally used as a rubefacient in the form of a liniment, also as a vesicant in the form of the common blister. They are applied to diseases and painful joints, also in cases of pleuritis, pericarditis, pneumonia, and other internal inflammations. Internally they are given in chronic affections of the nervous system, especially of the spinal cord. They have also a diuretic action. They should never be administered except by a physician.

CANTICLE, certain detached psalms and hymns used in the service of the Anglican Church, such as the *Venite exultemus*, *Te Deum laudamus*, *Benedicte omnia opera*, *Benedictus*, *Jubilate Deo*, *Magnificat*, *Cantate Domino*, *Nunc dimittis*, *Deus misereatur*, and the verses used instead of the *Venite* on Easter day. The word is also applied to that book of the Old Testament also known as the "Song of Solomon."

CANTIGNY, BATTLE OF. This action was notable, not because of the number of troops engaged, but because

it marked the beginning of offensive operations in Europe by the United States army. It took place on May 28, 1918, at Cantigny, a small town N. W. of Montdidier, France, which at the time was at the apex of the German thrust aimed at Amiens. It had a strong position on a hill that commanded a valley running into the American lines and gave the enemy valuable opportunities for observation. It had a series of cellars that were linked up with a long tunnel that gave excellent shelter for troops and artillery. The most careful preparations had been made for its reduction. Most of the engines of modern warfare, tanks, gas, flame throwers, smoke screens, machine guns, and artillery, were used by the Americans who went over the top at seven o'clock in the morning. They swept forward in three waves, with separate detachments to whom the task of "mopping up" the cellars of Cantigny had been assigned. In thirty-five minutes they had stormed the village, capturing 200 prisoners and inflicting heavy losses in killed and wounded on the enemy. The Americans also captured the defenses to the north and south of the town, making an advance of a mile on a two-mile front. Then they consolidated their newly won positions and defended them successfully against the fierce counter-attacks that followed. On a comparatively small scale, it was one of the most deftly executed and finished actions of the war. The American casualties were very small.

CANTILEVER, or CANTELEVER.
See BRIDGE.

CANTON, a small division of territory, constituting a distinct state or government, as in Switzerland.

CANTON, called also YANG-CHING (i. e., "city of rams"), a large commercial city and port in the south of China, and capital of the province of Kwang-tung (of which the name Canton is merely a corruption), on the N. or left side of the Shu-kiang, or Pearl river, in a rich alluvial plain, 70 miles N. of Macao and 90 N. W. of Hong-kong. The Pearl river is the estuary of the same stream that higher up is called Boca Tigre, or Boca Tigris. Farther up still, the stream is known as the Canton river; and this is but the chief channel by which the united waters of the Si-kiang and the Pekiang rivers reach the sea through the delta. The city is surrounded by walls partly brick, partly sandstone, 25 to 40 feet high, 20 feet thick, with an esplanade inside, 6 miles in circumference; and it is divided by a

partition wall running E. and W. into two unequal parts, the N. or old city, much the larger, and the S. or new city. The entire circuit, including suburbs, is nearly 10 miles. At the S. W. corner of the suburbs S. of the river, are the Hongs or European quarter, divided from the river by a quay, 100 yards wide, called Respondentia Walk. The streets, more than 600, are in general less than 8 feet wide, and very crooked. The houses along the water-side are built on piles, and subject to inundations.

There are two pagodas, the "Plain Pagoda," erected more than 10 centuries ago, 160 feet high, and an octagonal nine-storied pagoda, 175 feet high, erected more than 1,300 years ago; and 124 temples or Joss-houses. The Honam temple, one of the largest in Canton, covers with its grounds, 7 acres, and has 175 priests attached. The "Temple of Filial Duty" has 200 priests, supported by 3,500 acres of glebe-lands. The priests and nuns in Canton number more than 2,000, nine-tenths of them Buddhists. The "Temple of Five Hundred Genii" has 500 statues of various sizes in honor of Buddha and his disciples. Examination Hall, in the old city, is 1,330 feet by 583 feet, covers 16 acres, and has 8,653 cells. There are also in Canton prisons, granaries, a handsome English church, public schools and colleges, a foundling hospital, an English and an American missionary hospital, etc. Nearly half the craft on the river are fixed residences, and the population on land and water is estimated variously at from 1,000,000 to 1,500,000. The climate of Canton may be pronounced healthy. The average temperature ranges from 42° to 96° F.

The admirable situation of Canton, connected by three rivers with the whole province, E., N., and W., and to the W. with the distant interior of China, and commanding a safe and commodious anchorage for the largest vessels, explains how, from an early period, it was a favorite port with foreign merchants. The earliest notices date back to two centuries B. C. In 700 A. D. a regular market was opened and a collector of customs appointed. The Arabs made regular voyages hither as early as the 9th century. The Portuguese found their way to it in 1517, and were followed by the Dutch a hundred years later. These in turn were overtaken and supplanted by the English before the close of the 17th century, and an immense trade was carried on by the agents of the East India Company. Their monopoly ceased on April 22, 1834. The city was captured by the

allied French and English forces, December, 1857, and continued to be garrisoned by them till October, 1861. After the treaty of Nankin (signed Aug. 29, 1842), Canton was known as one of the five treaty ports, with Amoy, Foochow, Ningpo, and Shanghai.

The chief exports from Canton are tea, silk, sugar, and cassia; the chief imports, cotton, woolen and metal goods, food-stuffs, kerosene, etc. The total trade of the port is very large and is estimated at \$75,000,000.

CANTON, a city of Illinois, in Fulton co. It is on the Toledo, Peoria, and Western, and the Chicago, Burlington and Quincy railroads. It is the center of an important agricultural and mining community. There are agricultural implement works, cigar factories, foundries, marble works, etc. The city has a public library, theaters, parks, and hospitals. Pop. (1910) 10,453; (1920) 10,928.

CANTON, a town of Massachusetts, in Norfolk co. It includes several villages. It is on the New York, New Haven & Hartford railroad. The town is the seat of the Massachusetts Hospital School and has a public library and other public buildings. The industries include manufactures of woolen and rubber goods, electrical supplies, fire hose, etc. Pop. (1910) 4,797; (1920) 5,945.

CANTON, city and county-seat of Stark co., O.; on Nimishillen creek and the Pennsylvania, the Baltimore and Ohio, and the Wheeling and Lake Erie railroads; 60 miles S. of Cleveland. It is in a fine wheat-growing district, with coal, limestone, and pottery clay in the vicinity, and was for many years the residence of President McKinley.

Business Industries.—Canton is a manufacturing city of considerable importance. The principal industries are the manufacture of agricultural implements, brick and tile, foundry and machine shop products, iron bridges, steel goods, and stoves. There are two National banks, besides several State and savings banks.

Public Interests.—Canton has an electric light and street railway system, and well-paved streets. The notable buildings are the postoffice, high school, public library, auditorium, two hospitals, and McKinley National Monument, and several churches. Pop. (1910) 50,217; (1920) 87,091.

CANTONMENT, quarters for soldiers. Troops during prolonged operations, when not in close proximity to the enemy, and not in regular camp or bivouac, are often distributed among vil-

laces, which are then called cantonments.

CANTU, CESARE (kän-tö'), an Italian historian; born in Brivio, Lombardy, Dec. 2, 1805. Imprisoned for political causes in 1833, he employed his leisure in writing a historical romance, "Margherita Pusterla" (1838), one of the most successful of modern Italian romances; it gives a graphic picture of prison life. He wrote numerous historical and biographical works; his "Universal History" (35 vols.) has passed through several editions, and has been translated into other languages. He died near Milan, March 11, 1895.

CANTWELL, JOHN JOSEPH, an American Roman Catholic bishop, born in Limerick, Ireland, in 1874. He was educated at the Sacred Heart College, Crescent, Limerick; and St. Patrick's College, Thurles, Ireland. In 1899 he was ordained priest and in the same year came to the United States, becoming curate in Berkeley, Cal. After holding this office until 1904 he was appointed secretary to the archbishop of San Francisco, and from 1904 to 1914 he was vicar-general of the San Francisco diocese. In the latter year he was consecrated bishop of the diocese of Monterey and Los Angeles, Cal. He was a member of the board of directors of the Extension Society of the University of California.

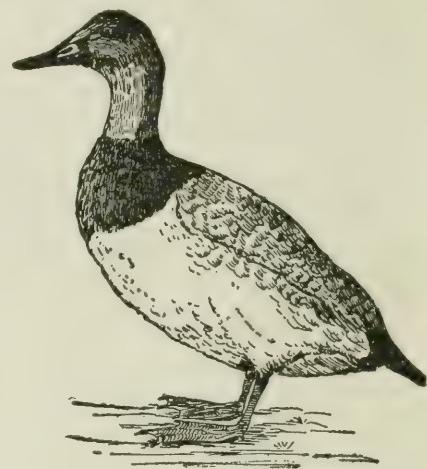
CANTYRE (kan-tir'), or **KINTYRE**, a peninsula of Scotland, between the Firth of Clyde and the Atlantic, forming the division of Argyleshire. It is 40 miles long from the Isthmus of Tarbet to the Mull of Cantyre in the S. W., and has an average breadth of about 7 miles.

CANUTE, or CNUT (ka-nüt', knut), King of England and Denmark, succeeded his father Swegen or Sweyn on his death in England in 1014 A. D., and confirmed the Danish power in England. He began by devastating the E. coast, and extended his ravages in the S., where, however, he failed to establish himself until after the assassination of Edmund Ironside, when he was accepted king of the whole of England (1017). Canute, who began his reign with barbarity and crime, afterward became a humane and wise monarch. He restored the English customs at a general assembly, and insured to the Danes and English equal rights and equal protection of person and property, and even preferred English subjects to the most important posts. His power was confirmed by his marriage with Emma, Ethelred's widow. At Harold's death in 1018 he gained Denmark; in 1028 he

conquered Norway; and in 1031 he made Malcolm of Scotland admit his superiority. Sweden also was vassal to him. He died in 1036 at Shaftesbury, leaving Norway to his eldest son, Sweyn; to the second, Harold, England; to the third, Hardicanute, Denmark.

CANVAS, a kind of coarse, unbleached linen cloth, used in old times for sifting, now for sails, tents, paintings, etc.

CANVAS-BACK, a species of duck, *Fuligula* or *Aythya valisneria*. It is a great favorite with huntsmen in the United States. It lives mainly on a



CANVAS-BACK DUCK

species of wild celery, which makes its flesh a great delicacy. It derives its name from the speckled feathers on the back.

CANZONA, or CANZONE (kän-tsō'na), a short song, in which the music is of much more importance than the words. It is one of the ancient forms of measured melody, and when the older writers employed it, it was usually made the vehicle for the display of skill and contrivance in the treatment of the phrases in fugal imitation. A secondary meaning of the word, scoffing or banter, perhaps accounts for the use of a form in which a musical imitation or mocking was shown. In the early part of the last century the word was used to describe an instrumental composition, similar to the sonata as then known.

CAOUTCHOUC (kat'shök or kat-chök). See RUBBER.

CAP, in ships, a strong piece of timber placed over the head or upper end of a mast, having in it a round hole to

receive the top or top-gallant masts, which are thus kept steady and firm.

CAP, a covering for the head, usually of softer materials and less definite form than a hat.

CAPE BRETON ISLAND (*brā-tōn'*), an island of the Dominion of Canada, separated from Nova Scotia, to which Province it belongs, by the narrow Gut or Strait of Canso; area 3,120 square miles. It is of very irregular shape, the Bras d'Or, an almost landlocked arm of the sea (with most picturesque scenery), penetrating its interior in various directions, and dividing it into two peninsulas connected by an isthmus across which a canal has been cut. The surface is rather rugged, and only small portions are suited for agriculture; but it possesses much timber, valuable minerals (several coal mines being worked), and the coast abounds in fish. Timber, fish, and coal are exported. The island belonged to France from 1632 to 1763, and Louisburg, its capital, was long an important military post. It was separate from Nova Scotia between 1784 and 1820. Chief town, Sydney. It is a famous summer resort. Near Glace Bay is a powerful long-distance wireless station. Pop. about 85,000.

CAPE COAST CASTLE, a settlement of Great Britain in the Gold Coast Colony, in upper Guinea, 315 miles W. of Lagos. The place lies in a chasm, and as its name implies, is defended by the great castle near the water's edge, and by three small forts on the hills behind, one of which serves as a lighthouse and signal station. Ceded by the Dutch to the English in 1665, Cape Coast Castle, from 1672, was possessed by several British African companies till 1843, when it was taken over by the government. In 1875 it was superseded by Accra as capital of the Gold Coast. The town has a trade in palm oil. There is a telegraph line to Accra, and a road from Cape Coast to Prahsue (75 miles). Pop. about 12,000.

CAPE COD, a noted peninsula of the United States on the S. side of Massachusetts Bay; 65 miles long and from 1 to 20 broad. It is mostly sandy and barren, but populous, and one of the most frequented summer resort regions of the Atlantic coast. The navigation around the cape is peculiarly baffling and hazardous. A proposition to cut a canal from Buzzard's Bay to Barnstable Bay dates from the early part of the 17th century, but nothing was actually done until 1906, when a charter was granted by the legislature of Massachusetts, a

company was formed, and work begun in 1909.

CAPE COD CANAL. See CANAL.

CAPE COLONY. See CAPE OF GOOD HOPE.

CAPE FEAR RIVER, a river of North Carolina; navigable for steam-boats for 120 miles from its mouth. Formed by the junction of the Deep and Haw rivers, its course is generally S. E. till it reaches the Atlantic Ocean.

CAPE FINISTERRE (-tär'), the westernmost point of Spain, in the province of Corunna, extending S. W. into the Atlantic, in lat. 42° 54' N., lon. 90° 21' W. Several naval battles were fought off this cape.

CAPE GIRARDEAU, a city of Cape Girardeau county, Mo.; on the Mississippi river, and on several railroads; 150 miles S. E. of St. Louis. It is the seat of St. Vincent's College and the Southeastern Missouri State Normal School, and has a National bank, several newspapers, etc. Pop. (1910) 8,475; (1920) 10,252.

CAPE HAITIEN, a town on the N. coast of Haiti. It has an excellent harbor, but has declined in importance in recent years. Pop. about 30,000.

CAPE HATTERAS, a dangerous cape on the coast of North Carolina, the projecting point of a long reef of sand. There is a lighthouse.

CAPE HORN, or **THE HORN**, the extremity of an island of the same name, forming the extreme S. point of South America. It is a dark, precipitous headland, 500 to 600 feet high, running far into the sea. Navigation round it is dangerous on account of frequent tempests. The cape was first doubled in 1616 by Schouten, a native of Hoorn, in Holland, whence its name.

CAPE MATAPAN, a promontory of Greece, forming the S. extremity of the Peloponnesus, in lat. 36° 23' N., lon. 22° 29' E. The name *Teanarum*, or *Promontorium Teanarium*, was applied by the Greeks to the headland, and to the small peninsula N. of it, connected with the great Taygetic peninsula by a narrow isthmus.

CAPEN, EDWARD WARREN, an American educator, born in Jamaica Plain, Mass., in 1870. He graduated from Amherst College in 1894 and from the Hartford Theological Seminary in 1898. After taking post-graduate courses at Columbia, he was appointed lecturer on special phases of sociology at the Hartford Theological Seminary in II—Cyc

1902. He was lecturer on sociological subjects on the American Board of Foreign Missions from 1904 to 1907. In 1911 he was one of the faculty of the Kennedy School of Missions, becoming instructor in sociology, associate professor, professor, and dean successively. He was a member of many important commissions and was a delegate to several international conferences on missions. In 1912 he was ordained to the Congregational ministry. He wrote "Sociological Progress in Mission Lands" (1913); and many articles and pamphlets on missions. He also edited several works relating to missions.

CAPE NOME, a cape and center of a rich gold mining region, on the S. face of the peninsular projection of Alaska, which separates Kotzebue Sound on the N. from Bering Sea on the S., and terminates on the W. in Cape Prince of Wales, the extent of the North American continent.

CAPE OF GOOD HOPE, a promontory near the S. extremity of Africa, at the termination of a small peninsula extending S. from Table mountain, which overlooks Cape Town. This peninsula forms the W. side of False Bay, and on its inner coast is Simon's Bay and Simon's Town, where there is a safe anchorage and a British naval station. Bartholomew Diaz, who discovered the Cape in 1487, called it Cape of Storms; but John II. of Portugal changed this to its present designation. It was first doubled by Vasco da Gama in 1497. Here is one of the principal astronomical institutions of the world. About the middle of the 16th century the French astronomer, Lacaille, made an exceedingly valuable series of observations at the Cape. Ever since the English have had a colony there they have kept up astronomical work, the Cape having been the scene of the labors of several celebrated English astronomers, among them Sir John Herschel.

CAPE OF GOOD HOPE, a province in the Union of South Africa, which, up to 1910, was known as Cape Colony. It is located at the southern extremity of the African continent, surrounded by the ocean on W., S., and E., and on the N. by Southwest Africa and on the N. and N. E. by Bechuanaland, the Orange Free State, Basutoland, and the province of Natal. The area is 276,000 square miles. The country is fertile in sections, but arid in others. There are several mountain ranges that divide the country into great plateaux or terraces. The most important rivers are the Orange, Olfants, Gauritz, Gamtoos, and Great Fish. The country is rich in minerals, its most

valuable product being diamonds. More of these are produced here than in any other part of the world. The famous Kimberley and DeBeers mines are located in the province. There are also large mines of copper, coal, gold, and iron, while amethysts and agates are frequently found. The climate is healthful and, except in certain sections, the heat is not great. The mean temperature for the year at the capital, Cape Town, is about 62 degrees. Grain is raised in considerable quantity as well as vegetables and a wonderful variety of fruits, such as apples, pears, plums, peaches, melons, oranges, etc., which form important articles of commerce. The country, however, is better adapted for grazing than agriculture, and sheep-raising is the most important industry. The value of the wool exported is little less than the value of the diamonds. Cattle breeding also is extensively carried on along the coast and in the northern and eastern districts. The exports in 1919 were about \$45,000,000, and the imports over \$75,000,000. The figures for exports do not include diamonds which, in themselves, have an annual value of \$60,000,000. There are nearly 4,000 miles of railway in operation in the province. The chief towns are Cape Town, Port Elizabeth and Kimberley. On May 31, 1910, the colony, under its present name, was merged into the Union of South Africa. The population is about 3,000,000, of which about 600,000 are Europeans. See SOUTH AFRICA, UNION OF.

CAPE ORTEGAL, a rugged promontory forming the N. extremity of Spain, extending into the Bay of Biscay, in lat. 43° 45' N., lon. 7° 56' W.

CAPER, the unopened flower-bud of a low trailing shrub (*Capparis spinosa*, order *Capparidaceæ*), which grows from the crevices of rocks and walls, and among rubbish, in the countries bordering the Mediterranean. Picked and pickled in vinegar and salt they are much used as a condiment (caper sauce being especially the accompaniment of boiled mutton). The plant was introduced into Great Britain as early as 1596, but has never been grown on a large scale. The flower-buds of the marsh marigold (*Caltha palustris*) and the nasturtium are frequently pickled and eaten as a substitute for capers.

CAPERCAILZIE, the wood grouse, mountain cock, or cock of the woods—a species of grouse, *Tetrao urogallus*, of large size, formerly indigenous in the highlands of Scotland, but which became extinct, and had to be reintroduced from the Scandinavian Peninsula, where it is

abundant in the pine forests, feeding on the seeds. The general color is black and green, with white marks on the wing and tail.

CAPE RIVER, or **RIO DE SEGOVIA** (properly *Vaunks*, or *Wanx*), a river of Nicaragua, which after a generally N. E. course of nearly 300 miles, enters the Caribbean Sea, after forming part of the boundary between Honduras and Nicaragua.

CAPERNAUM, a city of Galilee in Palestine, about 70 miles N. by E. from Jerusalem. It is situated on the N. W. shore of the Sea of Tiberias. It was a place of considerable importance in the time of Christ, who describes it as exalted unto heaven. The place derives its chief interest from the manner in which it is mentioned in the New Testament. It was here that Jesus Christ began His public ministry; and in its neighborhood He delivered the Sermon on the Mount.

CAPERS, WILLIAM THEODOTUS, an American Protestant Episcopal bishop, born in Greenville, S. C., in 1867. He studied at the South Carolina College, Furman University, and at the Theological Seminary of Virginia, graduating from the latter institution in 1894. From 1887 to 1890 he was engaged in business. He was ordained priest of the Protestant Episcopal Church in 1895 and served as rector and dean of several churches in North Carolina, South Carolina, Missouri, and Kentucky. In 1912 and 1913 he was rector of the Church of the Holy Apostles, Philadelphia. He was elected bishop of the missionary district of Spokane, but declined the appointment. In 1913 he was appointed bishop of west Texas.

CAPERTON, WILLIAM BANKS, an American naval officer; born at Spring Hill, Tenn., June 30, 1855. He entered the United States Naval Academy and was graduated in the class of 1875. He had a long and varied service on every sea. In the Spanish-American War he was an officer on the "Marietta," which accompanied the "Oregon" in her celebrated race to get to Cuba in time to take part in the fight against Cervera's squadron. He was made rear-admiral in 1913 and had command of the cruiser squadron of the Atlantic fleet in 1915. He had considerable experience in the West Indies, in connection with disturbances in Haiti and San Domingo. During the World War he was on duty in the Naval Department, Washington, and rendered efficient service in the naval prosecution of the war.

CAPE ST. VINCENT, the S. W. point of Portugal; noted for the naval victory

gained off it by Sir John Jervis (afterward Earl of St. Vincent) on Feb. 14, 1797.

CAPE SPARTIVENTO, ancient *Herculis Promontorium*, a promontory of southern Italy, forming the S. E. extremity of Calabria; lat. $37^{\circ} 57' N.$, lon. $16^{\circ} 5' E.$

CAPET (kā'pet or kap-ā'), the name of the French race of kings which has given over 100 sovereigns to Europe. The first of the Capets known in history was Robert the Strong, a Saxon, made Count of Anjou by Charles the Bald, and afterward duke of the Ile de France. His descendant, Hugh, son of Hugh the Great, was in 987 elected King of France in place of the Carlovingians. On the failure of the direct line at the death of Charles IV., the French throne was kept in the family by the accession of the indirect line of Valois, and in 1589 by that of Bourbon. Capet being thus regarded as the family name of the kings of France, Louis XVI. was arraigned before the National Convention under the name of Louis Capet.

CAPE TOWN, capital of the Cape of Good Hope, South Africa; between the N. base of Table Mountain and Table Bay. The town was laid out by its Dutch founders with mathematical precision—the main thoroughfares crossing one another at right angles. The houses of old Cape Town are mostly flat-roofed, oblong, and whitewashed. The beautiful government gardens in the heart of Cape Town serve the purposes of a public park. The gardens are about 14 acres in extent, and contain upward of 8,000 varieties of trees and plants. The Houses of Parliament, and the public library and museum, are close to the entrance of the avenue; and the Fine Arts Gallery in New street also faces the Botanic Gardens. The city has a regular supply of water, and is well lighted. There are spacious markets generally well supplied with fish, vegetables, and fruit; and public sales of produce, wool, feathers, etc., take place weekly. A large break-water, and an excellent system of docks have made Table Bay a place of call for passing vessels of all nations. Pop. (1918, white) 99,693.

CAPE VERDE, the most westerly headland of Africa, jutting out into the Atlantic Ocean, between the rivers Gambia and Senegal, in $14^{\circ} 53' N.$ lat., $17^{\circ} 34' W.$ lon. It was discovered by the Portuguese in 1443.

CAPE VERDE ISLANDS, a group in the North Atlantic Ocean, belonging to

Portugal, about 370 miles W. of Cape Verde, on the W. coast of Africa, which, as well as the islands, derives its name from the greenish tinge given to the adjoining sea by the abundance of seaweed. The group consists of 14 islands (of which 7 are inhabited), besides islets and rocks, having a united area of about 1,790 square miles. They are, in general, mountainous, rocky, and very ill supplied with water; all are evidently of volcanic origin, and, in Fogo, the most elevated of the group, an active volcano still exists. The climate is exceedingly unhealthy, and droughts are of frequent occurrence. The soil is, in general, poor, and vegetation, consequently, partial. Temperate and tropical fruits flourish luxuriantly. Wild animals are infrequent, but the domestic kinds are well nourished. The chief exports are cotton, indigo, cattle, hides, cotton cloth, and rum. Santiago, the principal island, and most southerly of the group, contains the town of Ribiera Grande, formerly the capital, but, during the dry season, the governor-general now usually resides at Porto Praya, which has a good harbor, and is occasionally touched by vessels bound for India. Porto Grande is, however, decidedly the best harbor in the group. In St. Nicolo, the island second in importance, very good cotton stuffs, stockings, etc., are made. The pop. (about 150,000) is a mixed race of Portuguese and negroes. These islands were discovered in 1450 by Antonio de Noli, a Genoese navigator, in the service of Prince Henry of Portugal, by which nation they were colonized. During the early part of the war between the United States and Spain (1898), the islands were made the rendezvous of the Spanish fleet under Cervera.

CAPE WRATH, a pyramidal promontory of unrivaled wildness and grandeur, the N. W. extremity of Scotland and of Sutherland, and running out into the Atlantic; lat. $58^{\circ} 38' N.$, lon. $4^{\circ} 58' 5'' W.$ Cape Wrath is 600 feet high, and there is a lighthouse near it, 400 feet above the sea, visible 25 miles off.

CAPIAS, a writ of several sorts: (1) *capias ad respondendum*, to answer the plaintiff in a plea of debt, trespass, or the like; (2) *capias ad satisfaciendum*, to satisfy the plaintiff after judgment in his favor; (3) *capias on mesne process*, under which, on an affidavit of debt being filed, a man's person could be arrested until payment was made or bail given. This last is now abolished except in cases where the creditor has good reason to believe that the debtor is about to leave the state to defeat collection, or has secreted assets to the same end; or

if the debt was made by virtue of false representations as to solvency of the debtor; or if fraud in any way has been practiced upon the creditor. The element of fraud is the essence of the procedure.

CAPILLARIES (from Lat. *capillus*, "a hair"), the tubes which convey the blood from the left side of the heart to the various parts of the body are called arteries, while those which return it to the right side of the heart, after it has discharged its various functions in the body, are known as veins. The name capillaries is given to the minute vessels which form the connection between the terminal branches of the arteries and the commencement of the trunks of the veins. These little vessels are of various sizes, some admitting only one blood corpuscle at once, while others are large enough to allow of the simultaneous passage of 2, 3, or more corpuscles. In the muscular tissue their average diameter is 0.003 of a line; they are smallest in the brain, and largest in bone. Their arrangement varies in different parts. The circulation of blood through the capillaries may be readily seen in the web between the toes of the hind foot of the frog, in the tongue of that animal, in the tail or gills of the tadpole, in the wing of the bat.

CAPILLARITY, in physics, that branch of the science which considers the properties of liquid surfaces.

CAPILLARY ATTRACTION, the molecular attraction or repulsion, specially the former, which takes place when one end of a tube of slender bore is immersed in a fluid. In the case supposed the fluid ascends it to a considerable height. Capillary attraction aids the passage upward of sap in the vessels of plants. It may be gravity acting at minute distances.

CAPITAL, a stock of wealth existing at a given instant of time is called *capital*; a flow of benefits from wealth through a period of time is called *income*. Many authors restrict the name *capital* to a particular kind or species of wealth, or to wealth used for a particular purpose, such as the production of new wealth; in short, to some specific part of wealth instead of any or all of it. Such a limitation, however, is not only difficult to make, but cripples the usefulness of the concept in economic analysis.

When a given collection of capital is measured in terms of the quantities of the various goods of which it is composed, it is called *capital goods*; when it

is measured in terms of its value, it is sometimes called *capital value*.

One of the best methods of understanding the nature of capital is to understand the method of keeping capital accounts.

A capital account or balance sheet is a statement of the quantity and value of the wealth of a specific owner at any instant of time. It consists of two columns—the assets and the liabilities—the positive and negative items of his *capital*. The liabilities of an owner are his debts and obligations to others; that is, they are the property rights of others for which this owner is responsible. The assets or resources of the owner include all his capital, irrespective of his liabilities. These assets include both the capital which makes good the liabilities, and that, if any, in excess of the liabilities.

The owner may be either a physical human being or an abstract entity called a "fictitious person" made up of a collection of human beings and keeping a balance sheet distinct from those of the individuals composing it. Examples of fictitious persons are an association, a partnership, a joint stock company, a government. With respect to a debt or liability, the person who owes it is the debtor, and the person owed is the creditor. The difference in value between the total assets and the total liabilities in any capital account is called the *net capital*, or *capital balance* of the person or company whose account it is.

A fictitious person is to be regarded as owning *all* the capital nominally intrusted to it and as owing its individual members for their respective shares; consequently there is no net capital balance belonging to the fictitious person, although in most cases there is a liability item called capital which represents what is owed to those most responsible for the management of the business. The most important example of a fictitious person is a joint stock company. Associated with the stockholders are usually also bondholders without voting power, but with the right to receive fixed payments stipulated in the bonds which they hold. The "capital" item in the capital account of a joint stock company is a liability due to the stockholders. It represents what is left after the value of all other liabilities is deducted from the value of the assets.

The items in a capital account are constantly changing, as also their values; so that, after one statement of assets and liabilities is drawn up, and another is constructed at a later time, the balancing item, or net capital, may have changed considerably. However, book-

keepers are accustomed to keep this recorded "capital" or "capital balance" item unchanged from the beginning of their account, and to characterize any increase of it as "surplus" or "undivided profits" rather than as capital.

The bookkeeper systematically undervalues the assets of the company and even omits some valuable assets altogether, such as "good will". The object of a conservative business man in keeping his books is not to obtain mathematical accuracy, but to make so conservative a valuation as to be well within the requirements of the law and expediency.

There are two valuations of the capital of a company, the bookkeeper's and the market's. The latter, being more frequently revised, is apt to be the truer of the two, although it must be remembered that each of them is merely an appraisement.

Insolvency is the condition in which the assets fall short of the liabilities other than capital. The capital balance is intended to prevent this very calamity; it is for the express purpose of guaranteeing the value of the *other* liabilities—those to bondholders and other creditors.

These other liabilities, for the most part, are fixed blocks of property, carved, as it were, out of assets, the value of which property the merchant or company has agreed to keep intact at all hazards. The fortunes of business will naturally cause the whole volume of assets to vary in value, but all the "slack" ought properly to be taken up or given out by the capital, the surplus, and the undivided profits. A man's capital thus acts as a safety fund or buffer to keep the liabilities from overtaking the assets. It is the "margin" he puts up as a guarantee to others who intrust their capital to him.

The assets may comfortably exceed the liabilities, and yet the cash assets at a particular moment may be less than the cash liabilities due at that moment. This condition is not true insolvency, but only insufficiency of cash. In such a case, a little forbearance on the part of creditors may be all that is necessary to prevent financial shipwreck.

A wise merchant, however, will not only avoid insolvency, but also insufficiency of cash. He will not only keep his assets in excess of his liabilities by a safe margin, but he will also see that his assets are invested in such a manner that he shall be able, by exchanging them for cash, to cancel each claim at the time and in the manner agreed upon.

There are three chief forms of assets; namely, cash assets, quick assets, and slow assets. A large part of the skill

of a business man consists in marshaling his assets so that he always has enough cash and enough quick assets to provide for impending debts, while maintaining at the same time enough slow assets to insure a satisfactory income from his business.

Since the liabilities of one man are also the assets of another, when one man fails and is able to pay only fifty cents on the dollar, the unlucky man who is his creditor—who has the first man's notes as assets—suffers a shrinkage in his own assets which may in turn mean embarrassment or even bankruptcy to him. It is usually true in a panic that the failures start with the collapse of some big firm, involving a shrinkage in the assets of others.

We have seen how the capital account of each person in a community is formed. Our next task is to express the total net capital of any community. This is the sum of the net capitals of its members, *i. e.*, all the innumerable assets of all the persons less all the liabilities of those persons. This net sum will be the same, of course, in whatever order the items are added and subtracted. There are two ways in particular.

The simplest is, first, to obtain the net capital balance of each person by subtracting the value of his liabilities from that of his assets, and then to add together these net capitals of different persons to get the capital of society. This method of obtaining society's net capital may be called the method of *balances*; for we balance the books of each individual. The other method is to cancel each liability against an *equal and opposite* asset, which equal and opposite asset, as we shall see, must exist somewhere in another individual's account, and then add the remaining assets. This method may be called the method of *couples*; for we couple items in two different accounts. The method of couples is based on the fact that every liability item in a balance sheet implies the existence of an equal asset in some other balance sheet. This is true because every debit implies a credit. A debt may be owed to somebody, as well as *from* somebody, a debtor, and the debt of the debtor is the credit of the creditor. It follows that every negative term in one balance sheet may be canceled against a corresponding positive term in some other. Each of these two methods—of balances and of couples—is important in its own way.

If, then, we suppose balance sheets so constructed as to include all the real and fictitious persons in the world, with entries in them for every asset and lia-

bility—even public parks, and streets, household furniture, and other possessions not formally accounted for in ordinary practice—it is evident that we shall obtain, by the method of balances, a complete account of the distribution of capital value among real persons; and, by the methods of couples, a complete list of the articles of actual wealth thus owned. In this list there will be no stocks, bonds, mortgages, notes, or other part rights, but only land, buildings, and other land improvements, and commodities. All debit and credit items being two-faced—positive and negative—cancel out in the total.

In spite of this close association between them, capital and income have thus far been considered separately. The question now arises: How can we calculate the value of capital from that of income or *vice versa*? The bridge or link between them is the *rate of interest*.

Although the rate of interest may be used either for computing from present to future values, or from future to present values, the latter process is far the more important of the two. Accountants, of course, are constantly computing in both directions, for they have both sets of problems to deal with; but the problem of time valuation which nature sets us is that of translating the future into the present; that is, the problem of ascertaining the value of capital. The value of capital must be computed from the value of its expected future income. We cannot proceed in the opposite direction and derive the value of future income from the value of present capital.

This statement is at first puzzling, for we think of income as derived from capital, and, in a sense, this is true. *Income* is derived from *capital goods*. But the *value* of the income is not derived from the *value* of those capital goods. On the contrary, the value of the capital is derived from the value of the income.

Not until we know how much income an item of capital will bring us can we set any valuation on that capital at all. It is true that the wheat crop depends on the land which yields it. But the value of the crop does not depend on the value of the land. On the contrary, the value of the land depends on the value of its crop.

The present worth of anything is what men are willing to give for it. In order that each man may decide what he is willing to give, he must have (1) some idea of the value of the future benefits his purchase will bring him, and (2) some idea of the rate of interest by which these future values may be trans-

lated into present values by discounting. With these data he may derive the value of any capital from the value of its income by means of the connecting link between them called the rate of interest. This derivation of capital value from income value is called "capitalizing" income.

Savings in its broadest sense includes more than simply saved money. It includes all the net increase in capital value after all income has been detached. It is the net appreciation, or the difference between the interest accrued and the income taken out. Savings are therefore still a part of capital. They are the part of capital saved from being taken out for income. They are not a part of income taken out. The individual is always struggling between saving more capital and taking out more income. He cannot do both—have his cake and eat it, too.

To recapitulate, in a few words, the nature of capital and income, we may now say that those parts of the material universe which at any time are under the dominion of man, constitute his capital wealth; its ownership, his capital property; its value, his capital value. Capital value implies anticipated income, which consists of a stream of benefits or its value. When values are considered, the causal relation is not from capital to income, but from income to capital; not from present to future, but from future to present. In other words, the value of capital is the discounted value of the expected income.

CAPITAL PUNISHMENT, in criminal jurisprudence the punishment of death (Lat. *capitis pena*). This extreme penalty, notwithstanding the practice of the world from the remotest times down to the present day, has frequently been reprobated by philosophers and philanthropists, who have even gone so far as to deny the right so to punish to any earthly power. In the United States, each State has jurisdiction over its own territory, and the laws punishing crime differ in several respects. In many of the States murder is by statute divided into different degrees, differing from each other by the malice and premeditation which accompany the act. Death by hanging, or electrocution, is the usual penalty for murder of the first degree, but in a few States imprisonment for life is substituted for capital punishment. For the various methods of execution, see EXECUTION.

CAPITALS, the large letters used in writing and printing, most commonly as the initial letters of certain words. As

among the ancient Greeks and Romans, so also in the early part of the Middle Ages, all books were written without any distinction in the kind of letters, large letters (capitals) being the only ones used; but gradually the practice became common of beginning a book, subsequently also the chief divisions and sections of a book, with a large capital letter, usually illuminated and otherwise richly ornamented.

CAPITATION-TAX, a tax or impost upon each head or person. A tax of this kind existed among the Romans, but was first levied in England in 1380, occasioning the rebellion under Wat Tyler. It was again levied in 1513, and by Charles II. in 1667, after which it remained in force till abolished by William III. in 1689.

CAPITOL (Lat. *capitolium*, from *caput*—a head); said to have been so called from a human head (*caput*) found when digging the foundations of the fortress of Rome, on the hill Tarpeius. Here a temple was built to Jupiter Capitolinus. The foundation was laid by Tarquinius Priscus, 616 B. C.; the building was continued by Servius Tullius; completed by Tarquinius Superbus, but not dedicated till 507 B. C., by the consul Horatius. It was destroyed by lightning, 183; burnt during the civil wars, 83; rebuilt by Sylla, and dedicated again by Lutatius Catulus, 69; twice again burnt A. D. 69, 80; rebuilt 70, 82; sacked by Genseric, June, 455. The Roman consuls made large donations to this temple, and the Emperor Augustus bestowed on it 2,000 pounds weight of gold, of which metal the roof was composed; its thresholds were of brass, and its interior was decorated with shields of solid silver. The Capitoline games, instituted 387 B. C. to commemorate the deliverance from the Gauls, were revived by Domitian, A. D. 86. The Campidoglio in Rome contains palaces of the senators, erected on the site of the Capitol by Michael Angelo soon after 1546. The word is also applied to the building in which the Congress of the United States meets.

The National Capitol.—The S. E. corner-stone of the Capitol was laid Sept. 18, 1793, "by Brother George Washington, assisted by the Worshipful Masters and Free Masons of the surrounding cities, the military, and a large number of people." The N. wing was ready for occupancy in 1800, the S. wing in 1808; but both were partially destroyed by the British in 1814. The foundation of the main building was laid in 1818 (March 24), the restoration of the wings having been commenced three years earlier; and

the whole was completed in 1827. July 4, 1851, the corner-stone of the S. extension was laid by President Fillmore, and this was finished in 1857. The N. extension was occupied by the Senate in 1859. The present dome, commenced in 1855, was completed eight years later, and Dec. 12, 1863, the American flag floated from its summit. The cost of the entire building was \$13,000,000: main building, \$3,000,000; dome, \$1,000,000; extensions, \$8,000,000; miscellaneous items, \$1,000,000. The length of the entire building is 751 feet 4 inches; its greatest breadth, 324 feet, and it covers a little over 3½ acres. The distance from the ground to the top of the dome is 307½ feet; the diameter of the dome, 135½ feet.

CAPITULARIES (*Lat. capitularia*), the name given to the laws, or royal enactments, issued by the Frankish kings. These laws proceeded from the great assemblies of the king, nobles, and bishops, which formed the estates of the kingdom, as distinguished from the laws issued for the separate states, which were called *leges*. They were divided into general and special *capitularies*, according to the more or less general nature of the interests which they embraced, and the mode of their publication. They have by no means been all preserved. The most famous are those of Charlemagne and of St. Louis.

CAPITULATION, in military language, the act of surrendering to an enemy upon stipulated terms, in opposition to surrender at discretion.

CAPO DI MONTE (kä'pō dē mon'tā), a former noted china factory near Naples. It was founded in 1736 by Charles III., King of Naples. His queen, Amelie de Saxe, took a lively interest in the manufacture, and the King himself worked in the factory. When Charles quitted the throne of the Two Sicilies for that of Spain he took with him the greater part of his workmen, and set up new porcelain works at Madrid. The products of both factories are much admired and can with difficulty be distinguished.

CAPON, a cock chicken castrated for the purpose of improving his flesh for the table.

CAPPADOCIA, in antiquity, one of the most important provinces in Asia Minor, the greater part of which is included in the modern province of Karahman. Its boundaries varied greatly at different times. It was conquered by Cyrus, and was ruled by independent kings from the time of Alexander the

Great until 17 A. D., when it became a Roman province. It was traversed by the river Halys, and among its chief towns were Comana, Ariarathia, and Tyana.

CAPPER, ARTHUR, an American public official, born at Garnett, Kan., July 14, 1865. He had a high-school education, and began work as a compositor on the Topeka "Daily Capital" in 1884, serving on the paper in various capacities until he became its proprietor in 1892. He also owned several rural papers and magazines. He was elected Governor of Kansas in 1915, and served until 1919, when he became United States Senator, his term expiring in 1925.

CAPPS, WASHINGTON LEE, an American naval constructor, born at Portsmouth, Va., Jan. 31, 1864. He graduated from the Annapolis Naval Academy in 1884. He was made naval constructor in 1895, and in 1903 was appointed chief naval constructor with the rank of rear-admiral. In 1913, he was chosen by President Wilson as Commissioner of the United States at the International Maritime Conference. From July to December, 1917, he was general manager of the Emergency Fleet Corporation.

CAPRERA (kä'-prä'rä), a small island in the Mediterranean Sea, off the N. coast of Sardinia. Length, 5 miles. This island is famous as the home of the Italian patriot, General Garibaldi.

CAPRI (kä'prē) the Roman *Capreæ*, a rocky but beautiful island in the Mediterranean, situated under the same meridian as the city of Naples, from which it is 20 miles distant. It is composed of hard calcareous rocks, which are disposed in two masses, with a considerable hollow between them. The highest of these two masses is called Anacapri, with a little town of the same name. The town of Capri (pop. about 5,000) stands much lower, on a sheltering rock toward the E. extremity of the island. By great industry the islanders have retained and secured patches of good soil on steep hillsides, and in the midst of rocks and cliffs; the cultivable parts produce most kinds of vegetables and fruits, a small quantity of excellent oil, and a considerable quantity of a light but generous wine. This wine, which is much used at Naples, is of two sorts, *Capri rosso* and *Capri bianco*, or red and white Capri. Extensive ruins of the villa of Tiberius, who resided a long time at Capreæ, are still shown near a bold perpendicular cliff at the E. end of the island.

CAPRICORNUS (Lat. *caper*, "a goat," and *cornua*, "a horn"), "the Goat," one of the 12 signs of the Zodiae, between Sagittarius and Aquarius; also the corresponding zodiacal constellation, one of Ptolemy's original 48. One of its brightest stars, Alpha, is a wide double, easily separated by the naked eye by anyone with good eyesight. Capricornus is surrounded by Aquila, Aquarius, Pisces Austrinus, Microscopium, and Sagittarius.

CAPRIDIÆ, a family of ruminant mammals, of which the genus *Capra*, or goat, is the type.

CAPRIFICATION, a process of fertilizing or accelerating the production of fruit, practiced in the Levant, particularly with the wild fig. It consists in suspending on the cultivated fig branches of the wild fig, which bring with them a small insect which penetrates the female flowers, carrying the pollen of the male flower on its body, or punctures the fruit in order to lay its eggs, which hastens the ripening, and may be the only effect. The Egyptians pretend to obtain the same result by puncturing the eye of the fruit with a needle that had been dipped in oil.

CAPRIVI, GEORG LEO, GRAF VON (kä-pré've), a German soldier and statesman; born in Berlin, Feb. 24, 1831; entered the army in 1849; fought in the campaigns of 1864 and 1866, and in the Franco-German war of 1870. In 1883-1888 he was at the head of the Admiralty. On the fall of Bismarck, in 1890, he became Imperial Chancellor and Prussian Prime Minister. His principal measures were the army bills of 1892 and 1893, and the commercial treaty with Russia in 1894, in which year he resigned. He died at Skyren, Feb. 6, 1899.

CAPSICUM, a genus of plants of the order *Solanaceæ*, consisting of annual or biennial plants, bearing membranous pods containing several seeds, noted for their hot, pungent qualities. *C. annuum*, a native of South America, furnishes the fruits known as chillies. These, as well as the fruits of *C. frutescens* and other species, are used to form cayenne pepper. For this purpose the ripe fruits are dried in the sun or in an oven, and then ground to powder, which is mixed with a large quantity of wheat flour. The mixed powder is then turned into cakes with leaven; these are baked till they become as hard as biscuit, and are then ground and sifted. *C. fructus* is the dried ripe fruit of *C. fastigiatum*, imported from Zanzibar. It is a small, ob-

long, scarlet, membranous pod, divided internally into two or three cells containing numerous flat, white, reniform seeds. It has no odor; its taste is hot and acrid. *Capsicum* fruits are used medicinally, in powder or as a tincture, externally, or as a gargle in cases of malignant sore throat, and internally as a stimulant in cases of impaired digestion.

CAPSTAN, a strong, massive apparatus of wood or iron made to revolve, and shaped like a truncated cone, and having the upper part provided with holes for the reception of bars or levers with which to cause it to revolve, and thus raise a heavy weight by winding a rope round it. It is especially used on shipboard for weighing the anchor. Capstans are single or double, according as they have one or two barrels upon the same spindle. The double capstan is revolved by two sets of men on two decks. They are known as "fore" or "aft" capstans, according to position. The fore capstan stands between the heel of the bowsprit and the foremast; the aft capstan abaft the mainmast. The drum capstan, for weighing heavy anchors, was invented by Sir Samuel Morland about 1661.

CAPTAIN, one who is at the head or has authority over others, especially: (1) The military officer who commands a company, whether of infantry, cavalry, or artillery. (2) An officer in the navy commanding a ship of war. The naval captain is next in rank above the commander, and in the United States ranks with a colonel. (3) The master of a merchant vessel.

CAPUA (ancient Capoa or Capua), a strongly fortified city of southern Italy, province Caserta, Terra di Lavoro, on the left bank of the Volturno, in a fine plain 18 miles N. of Naples. The city has a citadel, the work of Vauban. It is a finely built place and contains many handsome public edifices. Its trade is unimportant. The ancient Capua was situated about 2½ miles from the modern city. The remains of its amphitheater, said to have been capable of containing 100,000 spectators, and of some of its tombs, attest its former splendor and magnificence. The amazing fertility of its territory, and the commercial spirit of its inhabitants, rendered Capua one of the largest and richest cities of ancient Italy. It was destroyed by the Saracens, A. D. 840. Pop. about 14,000.

CAPUCHIN MONKEY (kap-ü-shēn'), a name given to various species of South American monkeys of the genus *Cebus*.

The hair of their heads is so arranged that it has the appearance of a capuchin's cowl, hence the name. The name is most frequently given to the Sai (*Cebus Capuchinus*), the Horned Sapa-jou (*C. fatuellus*), as well as to *Pithecia chiroptes*, a monkey belonging to an allied species.

CAPUCHINS, a branch of the Franciscan order of monks, so called from their peculiar capuche or cowl—a pointed hood attached to the ordinary Franciscan coat, and said to have been worn by St. Francis himself. This branch was founded by Matthew de Baschi, an Italian, but with him may be named the famous Lewis de Fossembrun. The Capuchins sought to restore the original rigor of the institutes of St. Francis, which Pope Innocent IV. had relaxed by granting the right to possess property to

from their connection with the legend on which Shakespeare has founded his tragedy of "Romeo and Juliet."

CAPYBARA, the *Hydrochœrus capybara*, or Watercavy of Brazil, an animal allied to the Guinea-pig. It is about three feet in length, and has the general appearance of a hippopotamus in miniature. It is of the rodent family *Cavidae*.

CARABIDÆ, a family of beetles, usually large, adorned with brilliant metallic colors, and either wingless or having wings not adapted for flying. The bombardier beetle belongs to this family.

CARABINE. See CARBINE.

CARABOBO, a state of Venezuela, between the Caribbean Sea and the state of Zamora; area, 2,974 square miles; pop. about 200,000, mostly inhabiting the fer-



CARACAL

the members of the Franciscan order. In 1525 they received the solemn sanction of Pope Clement VII. Because of their severe austerity, and especially for the innovation of the capuche, they were much persecuted by the other Franciscans. Bernard Ochino—their first Vicar-General—became a Protestant, as, afterward, did also their third. Eventually, however, they spread in great numbers over Italy, Germany, France, and Spain. In the 17th century they showed much zeal in prosecuting missions to Africa. There are two provinces in the United States, one centered at Detroit, Mich., and the other at Pittsburgh, Pa.

CAPULETS AND MONTAGUES, the English spelling of the names of the Cappelletti and Montecchi, two noble families of northern Italy, according to tradition of Verona, chiefly memorable

in the depression of Lake Valencia, where large crops of coffee, sugar, and excellent cacao are grown. Capital, Valencia; chief port, Puerto Cabello.

CARACAL, a species of lynx, the *Felis caracal* of Linnæus, of a reddish-brown color, with black ears, tipped with long, black hair. It is a native of Africa, India, Persia, and Turkey.

CARACALLA, MARCUS AURELIUS ANTONINUS, eldest son of the Emperor Severus, was born in Lyons, A. D. 188. On the death of his father he succeeded to the throne with his brother, Antoninus Geta, whom he speedily murdered. To effect his own security upward of 20,000 other victims were butchered. He was himself assassinated by Macrinus, the pretorian prefect, near Edessa, in 217. Among the buildings of

Caracalla in Rome, the baths—Thermæ Caracallæ—near Porta Capena, were most celebrated, and their ruins are still magnificent.

CARACARA, the name given to the birds of the sub-family *Polyborinæ*, which is an aberrant one belonging to the *Falconidæ*. They are found in South America, and feed on carrion.

CARACAS (kä-räk'äs), the capital of the Republic of Venezuela and of the Federal district, 6 miles (24 by rail) S. of La Guaira, its port. Built on the S. slope of the Avila (8,635 feet), it is 3,025 feet above the tide-level, and enjoys from this elevation a healthful air and a temperature ranging between 48° and 100° F. The streets, built at right angles, are broad and well paved. There are a handsome promenade and numerous public parks and gardens; excellent water and gas plants; street railways; and the termini of several steam railways. The most notable edifices are the Federal Palaces and other official buildings, including the president's "Yellow House"; the university; the Exhibition Palace; the cathedral; the magnificent basilica of St. Ann; and over a score of hospitals and charitable institutions. Besides the university, there are colleges of medicine, law, and engineering, and other technical schools. There is considerable export trade in cacao, coffee, tobacco, etc. It was founded in 1567, and has suffered severely at various times as the result of earthquakes. Pop. about 90,000.

CARACCI, LODOVICO, AGOSTINO, AND ANNIBALE (ka-rä'chē), three of the first painters of Italy, kinsmen, fellow-students, and co-laborers, natives of Bologna, and founders of the Bolognese School. Lodovico, born in 1555, was placed at an early age with Prospero Fontana to study painting. He made such slow progress that his master dissuaded him from the pursuit; upon which he left Fontana, and thenceforth studied the works only of the great masters, for which purpose he traveled to Venice and Parma. Returning to Bologna, he found his cousins, Agostino and Annibale, born in 1560, so well inclined to his art, that he persuaded their father, a respectable tailor, to leave their education to him. Agostino, born in 1558, learned engraving from Cornelius Cort, and attained to such excellence that many of his engravings are only distinguishable from his master's by the superiority of the drawing; his works in that style are highly valued. He never practiced painting, however, with any constancy. Lodovico retained Annibale

with himself. Annibale exhibited a perfect contrast to the phlegmatic calmness of Lodovico, to the accomplished fickleness of Agostino, and to the amiable mildness of both: he was rude and impatient in temper, though of so open and generous a nature that he is said to have kept his colors and his money in the same box, both of which were equally at the disposal of his scholars. Like Lodovico, he traveled about from place to place, improving himself by all that he saw, and aiming to combine in his own works the excellencies of the great works that he studied. The three opened an academy in Lodovico's studio, which became famous for the illustrious pupils whom it sent forth. The fame of the Caracci reaching Rome, Annibale was invited by Cardinal Odoardo Farnese to adorn his palace with paintings. He went, accompanied by Agostino, but their usual dissensions arose, and Annibale's intolent devotion to labor drove away his more festive comrade. Annibale spent eight years of his life on his admirable work of the Farnese Gallery. He did little after this, and died in 1609. He was buried, according to his own desire, by the side of Raphael. Agostino died in 1602; Lodovico lived until 1619. The works of the three kinsmen are principally found in Bologna and Rome. The Farnese Gallery is considered the greatest work of Annibale. The Louvre contains "St. John the Baptist," by Lodovico, and the "Communion of St. Jerome," by Agostino, which are respectively reckoned their best works in oil.

CARMEL, the brown mass which cane-sugar becomes at 220° C., used in cookery as a coloring and flavoring ingredient, in giving a brown color to spirits, etc. The name of a certain preparation of candy.

CARAT, a weight of 3½ grains; the twenty-fourth part of an ounce. It is used by jewelers to express the fineness of gold, the whole mass being supposed to be divided into 24 parts, and said to be so many carats fine, according to the number of twenty-fourth parts of pure gold contained in it. Twenty-four carat means all gold, 18 carat three-quarters gold. Fine gold consists of 22 carats of pure gold and two of alloy. The United States gold coinage is in these proportions. The carat used for diamonds and other precious stones equals 200 milligrams (3.086 grains).

CARAVAN, a Persian word used to denote large companies which traveled together in Asia and Africa for the sake of security from robbers, having in view, principally, trade or pilgrimages. In

Mohammedan countries caravans of pilgrims are annually formed to make the journey to Mecca. The most important are those which annually set out from Damascus and Cairo. Camels are used as a means of conveyance on account of their remarkable powers of endurance.

CARAVANSARY, or CARAVAN-SERAI, a large public building, or inn, for the reception and lodgment of caravans in the desert. Though serving instead of inns, there is this essential difference between them, that the traveler finds nothing in the caravansary for the use either of himself or his cattle, but must carry all his provisions and necessities with him. Caravansaries are also numerous in cities, where they serve not only as inns, but as shops, warehouses, and even exchanges.

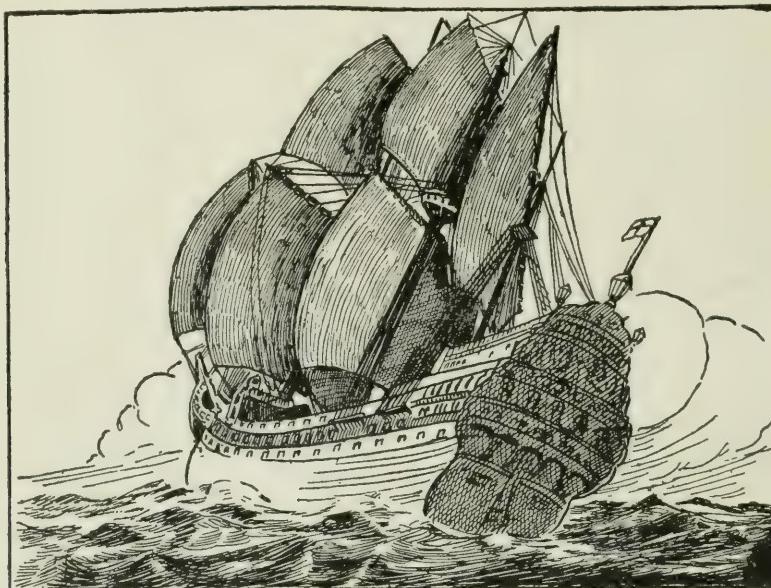
CARAVEL, the name of different kinds of vessels, particularly a small ship used by the Spaniards and Portuguese in the 15th and 16th centuries for long voyages. It was narrow at the poop, wide at the bow, and carried a

the sake of the well-known aromatic "caraway seeds" which it bears; these being, however, in strictness not seeds, but the *mericarps*, into which the fruit in this order splits when ripening. Their properties are due to the volatile caraway-oil, which is contained in the large oil-glands (*vittæ*) of the fruit, and is distilled on a large scale, chiefly for the preparation of the liqueur known as *kümmel*, but also for use in perfumery and in pharmacy, as an aromatic stimulant, and flavoring ingredient. Caraways are, however, chiefly used entire as a spice by bakers and confectioners, and the cultivation of the plant thus attains considerable importance, particularly in Germany and Holland.

CARBAZOTIC ACID. See PICRIC ACID.

CARBIDE, a compound formed by the union of carbon with an element, as iron or hydrogen.

CARBINE, a fire-arm used by cavalry and artillery, shorter in the barrel than



CARAVEL

double tower at its stern and a single one at its bows. It had four masts and a bowsprit, and the principal sails were lateen sails. It was in command of three such caravels that Columbus crossed the Atlantic and discovered America.

CARAWAY (*Carum Carvi* or *Curvi*), a species of *Umbelliferæ*, which has long been valued and cultivated in Europe for

the ordinary musket or rifle. It was used by light cavalry as early as the 16th century.

CARBINEERS, or CARABINEERS, formerly light horsemen, used chiefly to watch and harass the enemy, defend narrow passes, and act as skirmishers. The corresponding modern terms are hussars and lancers.

CARBOHYDRATE, any one of a large group of compounds, containing six carbon atoms or some multiple of six, and hydrogen and oxygen in the proportion in which they form water: that is, twice as many hydrogen as oxygen atoms.

CARBOLIC ACID, C_6H_5OH , also called Phenol, Phenic acid, Coal-tar, Creosote. Phenol is a secondary monoatomic aromatic alcohol, obtained by the dry distillation of salicylic acid. It is also formed by the dry distillation of coal, in the coal-tar oil. When pure it forms white deliquescent crystals melting at 35° to an oily liquid, which boils at 184° . It has a penetrating odor and burning taste; it is neutral; it coagulates albumen and has powerful anti-septic properties. It is used as a disinfectant, and to preserve meat, etc. It dissolves in alkalies, forming compounds called *phenates*. Potassium phenate crystallizes in white needles; when it is heated with iodides of ethyl, methyl, etc., double ethers are formed, as methyl-phenate, $C_6H_5OCH_3$. Chlorine, bromine, iodine, and nitric acid form with it substitution compounds. Phenol is benzene with one molecule of (OH) substituted for one atom of H.

CARBON, a tetrad, non-metallic element, symbol C. At. wt. 12. Carbon occurs in three allotropic forms—two crystalline (diamond and graphite), and one amorphous (charcoal). Diamond crystallizes in forms belonging to the regular system. It is transparent, either colorless, or yellow, pink, blue, or green. The hardest substance known, refracts light strongly, is infusible, but is burned into CO_2 in oxygen gas at white heat. Sp. gr., 3.5. It is a non-conductor of electricity. It is found in gravel in India, Brazil, etc. Graphite crystallizes in six-sided prisms. Sp. gr., 2.3. It is gray-black, with a metallic luster. It is a good conductor of electricity. Graphite often separates in scales from molten iron; it is used for lead pencils; it is often called black-lead. Amorphous carbon occurs more or less pure in lamp-black, wood charcoal, coal, coke, and animal charcoal. Sp. gr., from 1.6 to 2. It is porous, absorbs gases, removes color from organic liquids, is used as a disinfectant, and burns in the air at red heat, forming CO_2 . When boiled with H_2SO_4 , it is oxidized to CO, and SO_2 is also formed, which escape in gas used as a reducing agent. Carbon forms two oxides with oxygen, CO and CO_2 , carbonic oxide and carbonic anhydride. The compounds of this element are more numerous than those of all the other elements taken together. With hydrogen

especially it forms a very large number of compounds, called hydrocarbons, which are possessed of the most diverse properties, chemical and physical. With oxygen, carbon forms only two compounds, but union between the two elements is easily effected. It is one of the regular and most characteristic constituents of both animals and plants.

CARBONATES, compounds formed by the union of carbonic acid with a base, as the carbonate of lime, the carbonate of copper, etc. Carbonates are an important class of salts, many of them being extensively used in the arts and in medicine.

CARBONDALE, a city in Lackawanna co., Pa., on the Lackawanna river, and the Erie, the New York, Ontario and Western, and the Delaware and Hudson railroads; 16 miles N. E. of Scranton. It is in the center of an extensive coal-mining district; and contains many machine shops, car shops, foundries, etc. Carbondale has a National bank, several churches, a Roman Catholic academy, several newspapers, etc. Pop. (1910) 17,040; (1920) 18,640.

CARBON DISULPHIDE, or **BISULPHIDE**, a colorless liquid produced by burning carbon in an atmosphere of sulphur, or by distilling certain of the metallic sulphides with charcoal; sp. gr. 1.268. It is of great use in a large variety of manufacturing processes, and as a solvent.

CARBONIC ACID (CO_2), more properly called **CARBONIC ANHYDRIDE**, or **CARBON DIOXIDE**, a gaseous compound of 12 parts by weight of carbon and 32 of oxygen, colorless, without smell, 22 times as heavy as hydrogen, turning blue litmus slightly red, and existing in the atmosphere to the extent of 1 volume in 2,500. It is incapable of supporting combustion or animal life, acting as a narcotic poison when present in the air to the extent of only 4 or 5 per cent. It is disengaged from fermenting liquors and from decomposing vegetable and animal substances, and is largely evolved from fissures in the earth, constituting the choke-damp of mines. From its weight it has a tendency to subside into low places, vaults and wells, rendering some low-lying places uninhabitable. It has a pleasant, acidulous, pungent taste, and aerated beverages of all kinds—beer, champagne, and carbonated mineral water—owe their refreshing qualities to its presence, for though poisonous when taken into the lungs, it is agreeable when taken into the stomach. This acid is formed and given out during the respira-

tion of animals, and in all ordinary combustions, from the oxidation of carbon in the fuel. It exists in large quantity in all limestones and marbles. It is evolved from the colored parts of the flowers of plants both by night and day, and from the green parts of plants during the night. During the day plants absorb it from the atmosphere through their leaves, and it forms an important part of their nourishment.

CARBONIFEROUS, a term applied to the extensive and thick series of strata with which seams of *palæozoic* coal are more or less immediately associated. It is applied as well to that great system of formations which yield our main supply of coal, or to some divisions of that system, such as the Carboniferous limestone and the Carboniferous slates. It is also applied to the fossils found in any stratum belonging to the system.

CARBONIFEROUS SYSTEM, the Carboniferous succeeds the old Red Sandstone or some other member of the Devonian system, and passes upward into the Permian series. Its constituent groups vary much in the thicknesses of their sandstones, clays, limestones, and coals in different parts of the world, according to their conditions of deposition in conterminous seas, estuaries, and lagoons.

Carboniferous fossils comprise labyrinthodont and other amphibia; heterocercal fishes of many forms; numerous insects, myriapods, and arachnids; crustaceans of all orders except the highest decapods; mollusks of all the known orders; polyzoa; corals of the "rugose" kind; foraminifera; and some plants of the conifer and cycad groups, but far more of the fern, equisetum, and lycopod orders.

The Carboniferous Limestone consists of corals, encrinites, shells, and foraminifera of a great sea, with muds, sands, and coal-beds on its margins. These constitute the coal-measures of Russia, Styria, Italy, Corsica, the Boulonnais, etc., and the Lower coal-measures of Scotland.

CARBORUNDUM. See ABRASIVES.

CARBOY, a large and somewhat globular bottle of green glass protected by an outside covering of wickerwork or other material, for carrying vitriol or other corrosive liquid.

CARBUNCLE, a beautiful gem of a deep-red color with a mixture of scarlet, found in the East Indies. When held up to the sun it loses its deep tinge, and becomes exactly the color of a burning coal.

CARBUNCLE, in surgery, an inflammation of the true skin and tissue beneath it akin to that occurring in boils. It is more extensive than the latter, and instead of one has several cores. It is associated with a bad state of general health, from which condition its danger arises, for it may threaten life by exhaustion or blood poisoning. With regard to the local treatment, the principal thing to be done is to make a free incision into the tumor; as much of the contents as possible should then be pressed out, and a poultice applied. The patient's strength should be supported by nourishing and easily digested food, and tonics should be administered.

CARBURETOR. See MOTOR VEHICLE.

CARCAJOU, a species of badger found in North America, *Meles labradorica*.

CARCANET, a necklace or collar of jewels.

CARCASS, in military language, an iron case, with several apertures, filled with combustible materials, which is discharged from a mortar, howitzer, or gun, and intended to set fire to buildings, ships, and wooden defenses.

CARCASSONNE (kär-kä-sōn'), the *Carcaso* of Cæsar, the capital of the French department of Aude, on the Aude river and the Canal du Midi, 56 miles S. E. of Toulouse by rail. It is divided by the river into two parts, the old and the new town. The new town is well and regularly built; but the old town or *cité*, built on a height, is much more picturesque, with its ramparts and towers, some parts of them dating from the time of the Visigoths, and the rest, with the many towered castle, from the 11th or 13th century. In 1210 this old town suffered greatly at the hands of the fierce bigot Simon de Montfort and his crusaders, who here burned 400 of the Albigenses. In 1356 it effectually resisted the Black Prince. Of several fine churches the finest is St. Nazaire. Cloth-making is the staple industry; and there are also manufactures of paper, leather, linen, soap, etc. Pop. about 30,000.

CARCHEMISH, an ancient city on the Upper Euphrates, N. E. of the modern Aleppo, was long the N. capital of the HITTITES (*q. v.*), and was a city of great size and importance.

CARD, an instrument for combing, opening, and breaking wool, flax, etc., and freeing it from the coarser parts and from extraneous matter. It is made by inserting bent teeth of wire in a thick piece of oblong board to which a handle is attached. But wool and cotton are

now generally carded in mills by teeth fixed on a wheel moved by machinery. The word is derived through the French *carde*, a teasel, from L. *carduus*, a thistle, teasels having been used for cards.

CARDAMINE, an extensive genus of herbaceous cruciferous plants. *Cardamine pratensis*, the Cuckoo-flower or Lady's-smock, is a common but pretty meadow-plant, with large pale lilac flowers. A double variety is sometimes found wild. *C. hirsuta* is a common weed everywhere, varying in size, according to soil, from 6 to 18 inches in height. The leaves and flowers of this species form an agreeable salad. This species produces young plants from the leaves, all that is necessary being to place them on a moist grassy or mossy surface. *C. amara* is also not infrequent.

CARDAMOMS, the aromatic capsules of different species of plants of the natural order *Zingiberaceæ* (gingers), employed in medicine as well as an ingredient in sauces and curries. Those recognized in the United States Pharmacopœia, called true or official cardamoms and known in commerce as Malabar cardamoms, are the produce of *Elettaria (Alpinia) Cardamomum*, a native of the mountains of Malabar and Canara.

CARDBOARD, pasteboard paper stiffened by several layers being joined together. Bristol board is all white paper, and is made of two or more sheets, according to the thickness required. Other qualities are made by inclosing common thick paper between sheets of white or colored paper of the required quality.

CARDENAS, a seaport of Cuba, on the N. coast, 75 miles E. of Havana, with which it is connected by rail. It has a good harbor, and exports sugar and tobacco. Pop. about 30,000. During the blockade of the Cuban coast in the war between the United States and Spain a severe engagement took place here on May 11, 1898.

CARDIA, the heart; also the upper orifice of the stomach, called, on account of its vicinity to the heart, by the same Greek name. Cardialgia is the name commonly applied to the particular variety of pain called heartburn, arising from a disordered stomach, and accompanied by acid eructations.

CARDIFF ("the city on the Taff"), a municipal and parliamentary borough and seaport, the county town of Glamorganshire, Wales, situated at the mouth

of the Taff on the estuary of the Severn. It is a rapidly growing town, and the principal outlet for the mineral produce and manufactures of South Wales. Shipbuilding is carried on, and there are iron and other works on a large scale. Among the chief buildings are the county buildings, town-hall, infirmary, university college (for S. Wales and Monmouthshire), law courts, free library, museum, etc. The docks are extensive and well constructed. As regards tonnage entered and cleared, Cardiff is now the third port in the United Kingdom; in respect of coal exported it is the first. There is here a castle which dates from 1080. It is the property of the Marquis of Bute, who has modernized it, and converted part of it into a residence. The development of Cardiff has been greatly furthered by those in charge of the Bute property, which embraces most of the town. Pop. about 185,000.

CARDIFF GIANT, the name given to a rude statue 10½ feet high, dug up, in 1869, at Cardiff, N. Y., and exhibited for months as a petrification. The persons who thus deluded the public at last confessed that the "Giant" had been cut from a block of gypsum quarried at Fort Dodge, Ia., sculptured at Chicago, conveyed to Cardiff, and there buried and "accidentally discovered."

CARDIGAN BAY, a semicircular bend at St. George's Channel, on the W. coast of Wales, 54 miles wide from N. to S., and 35 miles deep, with a sweep of coast of 130 miles. It has 3 to 30 fathoms water, with three reefs. A strong current sweeps round the bay from S. to N. Almost all the harbors on the coast are obstructed by bars.

CARDINAL, a word first used of any cleric regularly settled (*incardinatus*, "inhinged") in any Church, then from the 8th century of the clergy in the cathedral, the bishop being regarded as the *cardo* or "hinge" of the diocese. Next, the forged decretals speak of the Pope as the *cardo* or "hinge" of the whole Church, and Leo IX. claims a high and singular position for the clergy of the Roman Church; but not till the time of Pius V. was the title formally restricted to its modern use, according to which it signifies the counsellors of the Pope who, next to him, hold the highest dignity in the church over which he rules.

The present college of cardinals has arisen (1) from the deacons who from early times assisted the Bishop of Rome, and who were originally seven in number; (2) from the presbyters who remained in the chief church, or administered *tituli*—i. e., subordinate churches

erected as need arose in the city; (3) from bishops who resided in the Roman diocese and helped the bishop proper. The *Liber Pontificalis* makes mention of such assistant bishops in Stephen IV.'s pontificate (768-772). After many fluctuations, the number of cardinal bishops was fixed by Sixtus V. at 6, of cardinal priests at 50, of cardinal deacons at 14, making 70 cardinals in all.

According to the present law the appointment (*creatio*) of cardinals rests with the Pope, who generally consults the existing cardinals, and often receives proposals from secular governments. Their seniority dates from the Pope's nomination, even if that nomination be made *in petto*—*i. e.*, even if the Pope merely states that he has determined to create a new cardinal without mentioning who he is, provided always that the Pope lives to proclaim the cardinal by name. The same qualifications of age, learning, character, etc., are required in the case of a cardinal and of a bishop. The cardinals in Conclave elect the new Pope, have constant access to him, and form his chief council. They have a vote at general councils, and, since the 13th century, precedence over all other members. They have quasi-episcopal jurisdiction within the churches from which they take their titles. They have had since Urban VIII. the title of "Eminence." The body of cardinals is called the Sacred College. Their insignia are the red cardinal's hat, which is given them by the Pope, and not worn, but suspended in the church of their title, and finally buried with them; the red *biretta*, the sapphire ring, the miter of white silk, the purple cassock, etc. Cardinals, however, who belong to a religious order, retain the color proper to it in their cassocks. If a cardinal holds an episcopal see, he must reside there; otherwise he must not leave Rome without permission. At the head of the college of cardinals stands the dean, who is usually Bishop of Ostia and senior of the cardinal bishops. It is he who consecrates the newly elected Pope, if not already a bishop. The chief affairs of the Roman Catholic church are in the hands of the cardinals not as such, but as the chief members of the Roman (administrative) congregation; but the cardinals possess no constitutional rights under the government of the papacy. They cannot even meet together without the Pope's leave. From Pole's death (1558) there was no English cardinal till Wiseman's time (1850); in the United States the first cardinal was McCloskey (1875); the second, Gibbons (1886); the third, Farley (1911); the fourth, O'Connell (1911).

CARDINAL BIRD, *Cardinalis virginianus*, a North American bird of the finch family, with a fine red plumage, and a crest on the head. Its song resembles that of the nightingale, hence one of its common names.

Virginian Nightingale.—In size it is about equal to the starling. Called also Scarlet Grosbeak or Cardinal Grosbeak and Redbird.

CARDINAL-FLOWER, the name commonly given to *Lobelia cardinalis*, because of its large, very showy, and intensely red flowers; it is a native of North America, but is much cultivated in gardens in Great Britain.

CARDINAL POINTS, the N., S., E., and W. points of the horizon; the four intersections of the horizon with the meridian and the prime vertical circle.

CARDINAL VIRTUES, or PRINCIPAL VIRTUES, in morals, a name applied to justice, prudence, temperance, and fortitude.

CARDING, the process wool, cotton, flax, etc., undergo previous to spinning, to lay the fibers all in one direction, and remove all foreign substances.

CARDITIS, inflammation of the heart substance. Inflammation of the lining membrane is *endocarditis*, of the external membrane, *pericarditis*. See HEART.

CARDOON, the *Cynara Cardunculus*, a perennial plant belonging to the same genus as the artichoke, and somewhat resembling it. It is a native of Canada. The thick, fleshy stalks and ribs of its leaves are blanched and eaten as an esculent vegetable.

CARDS, oblong pieces of pasteboard, inscribed with certain figures and points, and used in various games of skill and hazard. The origin of this invention is obscure. While it has by some been erroneously attributed to the Romans, by others it has been traced, perhaps with more plausibility, to an Asiatic source. The figures of the four suits were symbolical representations of the four great classes of men, and the names attached to these figures in England arose from a misapprehension of the names originally assigned to them. Thus, by the hearts are meant the *gens de chœur* (œur), the choir-men or ecclesiastics, and hence these are called *copas*, or *chalices*, by the Spaniards; whose word *espada*, sword, indicating the nobility and warriors of the State, has been corrupted into the English spade. The clubs were originally *trèfles* (trefoil leaves), and denoted the peasantry;

while the citizens and merchants were marked by the diamonds (*carreaux*, square tiles). The modern pack of cards consists of fifty-two cards, in four suits —two red, hearts and diamonds, and two black, spades and clubs; each suit consisting of three court or picture cards, the king, queen, and knave, and ten other cards distinguished by the number of their "pips" or spots, from ten to one respectively. The lowest of these is always called the "ace," and the two and three are often called the "deuce," and "tray." The natural rank of the cards in each suit is, king highest, and so on down to ace lowest; but in many games this rank is varied, as in Whist, where the ace is put highest of all, above the king. Sometimes the pack of cards is reduced to 32 by excluding the six, five, four, three, and two of each suit; it is then called a "piquet pack." An immense variety of games are played with cards, some involving chance only, some combining chance and skill, the best of them furnishing very agreeable and intellectual amusement. Some are round games, in which any number of persons may join, as Poker, Hearts, Loo, Pope Joan, etc.; some are for four persons, as Whist, and Euchre; some for two, as Piquet, Ecarté, Bézique, Cribbage; and even for one, called Solitaire.

CARDUCCI, GIOSUÈ (kär-dö-chi), an Italian poet and philologist, born in Valdicastello, Tuscany, July 27, 1836. He was made professor of Italian literature in the University of Bologna in 1860. He had previously written essays on the history of literature; and a small volume of lyrics, "Rimes" (1857). But his poetical genius is better shown in the collections of his fugitive pieces published a little later: "Serious Trifles" and "The Decennials." His "Hymn to Satan" (1863), published under the pseudonym "Enotrio Romano" made an extraordinary impression, and was formally defended in "Satan and Satanic Polemics" (1879). The breadth and range of his genius, as well as his mastery of poetic form, are seen in the "Poems of Enotrio Romano" (1871); "New Poems" (1873); "Iambics and Epodes" (1882); "New Rimes" (1887). He died Feb. 15, 1907.

CAREW, THOMAS, an English poet; born in 1598. He stood high in favor with Charles I., and was an intimate friend of the greatest poets and scholars of his time in England. His poems are light and airy, sometimes licentious, always graceful and elegant in form. They are mostly songs or odes; he also wrote "Cœlum Britannicum," a masque (1633). He died in 1639.

CAREX, a genus of plants, of the natural order *Cyperaceæ* (Sedges). There are numerous species found in cold, damp climates, the genus *Cyperus* taking the place of Carex in the tropics. Carices are innutritious to cattle. *C. arenaria* binds together the sand of the sea-shore. Its rootstock, with those of *C. disticha* and *C. hirta*, is reputed to be diaphoretic and diuretic. The Laplanders protect their hands and feet against frost bites by placing the leaves of *C. sylvatica* in their gloves and shoes. The leaves of some species are used for tying the hops to the poles in English hop-gardens, and in Italy they are placed between the staves of wine casks, are woven over Florence flasks, and sometimes used for making chair bottoms.

CAREY, HENRY, an English poet and playwright; born about 1696; as the author of "Sally in Our Alley" his claim to the notice of posterity is a strong one, and "Namby Pamby" is another of his good songs. His farces, among them "Hanging and Marriage," are not so lively. He died in London in 1743.

CAREY, HENRY CHARLES, an American economist, born in Philadelphia, Dec. 15, 1793; trained in his father's publishing house, he accumulated a competence from the business and retired to devote himself to study. The "Essay on the Rate of Wages" (1836) and "The Principles of Political Economy" (1837-1840) won him an authoritative international position, in spite of what was then an extravagantly unorthodox opposition to Adam Smith and his followers. He next produced: "The Credit System in France, Great Britain, and the United States" (1838); "The Past, The Present, and The Future" (1848); and "The Principles of Social Science" (1858-1859). He died in Philadelphia, Oct. 13, 1879.

CAREY, MATHEW, an American publisher and prose writer, born in Ireland, Jan. 28, 1760. The best known of his political writings was his "Olive Branch" (1814). It was an effort to promote harmony among political parties during the War of 1812. It passed through ten editions. In 1819 he published his "Irish Vindications," and in 1822, "Essays on Political Economy." He died in Philadelphia, Pa., Sept. 16, 1839.

CAREY, ROSA NOUCHETTE, an English novelist; born at London in 1840. She began her literary career in 1868 and speedily gained a large audience, especially among young girls. She wrote nearly 40 works of which some of the best known are "Wee Wifie"

(1869); "Wooed and Married" (1875); "Uncle Max" (1887); and "The Sunny Side of the Hill" (1908). She died in 1909.

CAREY, WILLIAM, an English Oriental scholar and missionary, born in Northamptonshire, Aug. 17, 1761. He was early apprenticed to a shoemaker, but his natural turn for languages, and his zeal for the spread of the Gospel, were too strong to be overcome. With the little assistance he could procure he acquired Latin, Greek, and Hebrew, and likewise studied theology. In 1786 he became pastor of a Baptist congregation at Moulton, and in 1787 was appointed to a similar situation in Leicester. In 1793 he sailed for the East Indies as a Baptist missionary, and in 1800, in conjunction with Marshman, Ward, and others, he founded the missionary college at Serampore. Here he had a printing press, and issued various translations of the Scriptures. His first work was a "Bengali Grammar." It was followed by the "Hitopadesha," in the Maharratta tongue, a "Grammar of the Telenga and Carnatic," and a "Bengali Lexicon." Under his direction the whole Bible was translated into 6, and the New Testament into 21 Hindustani dialects. He was long professor of Sanskrit, Maharratta, and Bengali, in Calcutta. He died in Serampore, India, June 9, 1834.

CARGO, the general term used to designate all merchandise carried on a trading ship.

CARIA (kā'rē-a), a country of Asia Minor, whose boundaries have been dissimilar in different ages. Generally speaking, it was at the S. of Ionia, at the E. and N. of the Icarian Sea, and at the W. of Phrygia Major and Lycia. It has been called Phoenicia, because a Phoenician colony first settled there. It afterward received the name of Caria, from Car, one of its kings, who first invented the auguries of birds. Its chief town was Halicarnassus.

CARIB, the name given by the early European navigators to the inhabitants or aborigines found on the smaller of the West India Islands, and also inhabiting some part of the adjacent American continent. The natives of the larger and more northern islands entertained a great dread of this race of Carib from their more war-like and savage nature; and the Spaniards, finding them always a bold and determined enemy, did their utmost to exterminate the whole race, and finally expelled all but a mere remnant from their native possessions. Those who escaped the Spanish sword sought refuge in that part of southern

America near the mouth of the Orinoco, except a few whom the English removed and landed on the island of Ruatan, in the Bay of Honduras. The Caribs have always been distinguished from the rest of the American peoples by their athletic stature, firmness, courage, and resolution. They treat all other aborigines with contempt, and consider themselves superior to every other race. They were formerly accused of cannibalism, and, there is much reason to suspect, with justice.

CARIBBEAN SEA, the grandest inlet of the Western hemisphere—corresponding in several respects to the Mediterranean in the Eastern—is separated from the Gulf of Mexico by Yucatan, and from the Atlantic Ocean by the great arch of the Antilles. It forms the turning-point in the vast cycle of waters known as the Gulf Stream. It pours its waters into the Gulf of Mexico on the W.

CARIBEE BARK, the bark of the *Exostemma caribaeum*, a tree growing in the West Indies, closely allied to Cinchona, and occasionally substituted for the true species of the latter. It is called also St. Lucia Bark.

CARIBBEES, or LESSER ANTILLES, usually divided into the Windward and Leeward Islands, a section of the West India Islands.

CARIBOO, or CARIBOU, an animal, the *Cervus silvestris*, or American Woodland Reindeer, the Attehk of the Cree, and Tantseeah of the Copper Indians. It is employed by the Laplanders to draw their sledges.

CARICATURE, a representation of the qualities and peculiarities of an object, but in such a way that beauties are concealed and peculiarities or defects exaggerated, so as to make the person or thing ridiculous, while a general likeness is retained. Though a degenerate, it is one of the oldest forms of art. Egyptian art has numerous specimens of caricature, and it has an important place in Greek and Roman art. It flourished in every European nation during the Middle Ages, and in the present day it is the chief feature in the so-called comic journals.

CARIES (kā'ri-ēz), a disease of bone analogous to ulceration in soft tissues. The bone breaks down, or may be said to melt down into unhealthy matter, which works its way to the surface and bursts. Excision of the carious portion of the bone is often effected with good results, but the disease often results in

death. Caries of the teeth is decay of the dentine or body of the tooth.

CARILLON (*car-ēl'yōn*), a species of chime, played by hand or clockwork on a number of bells, forming a complete series or scale of tones or semi-tones, like those of the organ or harpsichord.

CARINTHIA (*Ger. Kärnthen*), formerly a W. duchy or province of Austria-Hungary, on the borders of Italy, now one of the provinces of the REPUBLIC OF AUSTRIA (*q. v.*). Area, 3,682 square miles including certain territories made subject to a plebiscite by the Treaty of St. Germain between the Allies and Austria. It is extremely mountainous, generally sterile, and one of the most thinly populated provinces of Austria. The principal river is the Drave. The iron, lead, and calamine mines are the main sources of its wealth, though there are several manufactories of woolens, cottons, silk stuffs, etc., most of which are in Klagenfurt, the capital. Pop. about 300,000.

CARISBROOKE, a village near the center of the Isle of Wight, and overlooked by the ruins of its ancient castle, where Charles I. was imprisoned 13 months previous to his trial and execution.

CARLETON, HENRY GUY, an American journalist and dramatist, born in Fort Union, New Mexico, June 21, 1855. He pursued journalism in New Orleans and New York City, and has written several plays: "Memnon, a Tragedy"; "Victor Durand" (1884); and "The Pembertons" (1890). He died Dec. 10, 1910.

CARLETON, WILL, an American poet, born in Hudson, Mich., Oct. 21, 1845. He was best known in literature by his ballads of home life, many of them having gained great popularity. His books include: "Poems" (1871); "Farm Legends" (1875); "City Ballads" (1888); "City Legends" (1889); "Songs of Two Centuries" (1902); "Drifted In" (1908); etc. He died in 1912.

CARLETON, WILLIAM, an Irish novelist, born in Frilisk, County Tyrone, in 1794. His intimate acquaintance with the traits and tendencies of Irish peasant character, and his harmless, graceful, and unwearying humor, were conspicuous in his first success, "Traits and Stories of the Irish Peasantry." Then came: "Willy Reilly"; "The Fair of Emyvale," "Fardorough the Miser," and several other novels of great power, in which much that seems anomalous in the manners and methods of the author's

countrymen is made clear through the medium of a happy style and a realistic humor. He died in Dublin, Jan. 30, 1869.

CARLETON COLLEGE, a coeducational institution in Northfield, Minn.; organized in 1866, under the auspices of the Congregational Church; reported at the end of 1919: professors and instructors, 41; students, 450; number of graduates, 1,281; president, D. J. Cowling, D. D.

CARLIN, JAMES JOSEPH, an American educator, born at Peabody, Mass., in 1872. He graduated from Boston College in 1892. He took post-graduate courses in several Jesuit institutions and was professor of theology, sacred scripture, and canon law at Woodstock Seminary from 1904 to 1908. He was ordained priest in 1907, and from 1910 to 1912 was lecturer on scholastic philosophy at Holy Cross College. He was chosen president of this institution in 1918.

CARLISLE (*kar-lil*), an ancient city of England; the capital of Cumberlandshire; at the confluence of the Caldew and Eden rivers. It has steamboat and railroad communications with Liverpool, Belfast, etc. Ginghams, cotton checks, etc., are its chief manufactures. Its most noted building is a cathedral founded by William Rufus (1101), and containing perhaps the finest choir in England. There is also a castle, founded in 1092. Carlisle was the ancient capital of the kings of Cumbria, and was sacked by the Danes (900). During the English and Scotch border-wars it was frequently besieged. It was here that Buccleuch rescued Kinmont Willie. During the Civil War the town twice surrendered to the Parliamentarians (1645 and 1648). Pop. about 52,000.

CARLISLE, borough and county-seat of Cumberland co., Pa.; on the Cumberland Valley and the Philadelphia and Reading railroads; 18 miles W. of Harrisburg. It is the farming and manufacturing trade center of Cumberland county, and is the seat of Dickinson College, Metzger Female College, and of the United States Indian Training School up to the time of its discontinuation. It has large manufacturing establishments, Hamilton Library, Todd Hospital, etc. It was the headquarters of Washington during the Whiskey Rebellion in 1794, and was bombarded by the Confederates in 1863. Pop. (1910) 10,303; (1920) 10,916.

CARLISLE, EARLS OF, a title of the descendants of Charles Howard (1629-1685), the second son of Sir William

Howard, of Nawarth, Cumberland; who, by adherence to Cromwell and afterward to Charles II. rose to be first earl of Carlisle.

CARLISLE, JOHN GRIFFIN, an American statesman, born in Campbell co., Ky., Sept. 5, 1835; received a common-school education, studied law, and was admitted to the bar (1858). He served several terms in the lower house of the State Legislature. During the Civil War he actively opposed secession, and in 1866 and 1869 was a member of the State Senate. He was lieutenant-governor of Kentucky (1871-1875), was elected to Congress (1876), and five times re-elected. His ability soon made him one of the Democratic leaders. In the 48th, 49th, and 50th Congresses he was chosen Speaker. In 1890 he was elected United States Senator, but resigned in March, 1893, to accept the portfolio of Secretary of the Treasury in President Cleveland's Cabinet. At the close of his term he settled in New York City to practice law. He died July 31, 1910.

CARLISTS, a Spanish political faction which advocates the claims of Carlos of Bourbon and his descendants to the Spanish throne. In 1833 the Carlists, whose chief strength lay in the Basque provinces, and who, because of their tenets of absolutism and priestcraft, were secretly favored by the Pope and the eastern powers, raised the standard of revolt. They had the advantage until 1836, when Espartero inflicted on them a terrific defeat at Luchana. In August, 1839, their commander, Maroto, treacherously made peace, and the remaining Carlists soon fled to France. In 1873 the grandson of the first pretender raised another revolt in the Basque provinces of Navarre and Biscay, but after several sharp conflicts the rebels were hemmed in along the N. coast, and in 1876 the pretender and his chief supporters fled into France.

CARLOMAN, the eldest son of Charles Martel, whom he succeeded as King of Austrasia in 741. He and his brother, Pepin, united in defending their dominions against the encroachments of their neighbors, and defeated the Germans in 743. Carloman then entered Saxony, took its duke prisoner, and, after several successful expeditions, became a monk of the order of St. Benedict. He assembled a famous council in 742, whose acts bear his name. Died 755. There were three others of the same name: The first was the younger brother of Charlemagne, with whom he had some contention about the kingdom, but, on

his death, in 771, left him in full possession. The second was the son of Louis II., whom he succeeded in 879, in conjunction with his brother Louis III. On the death of the latter, he was declared sole King of France, and was killed in hunting, by a wild boar, in 884. The third, Carloman, was the eldest son of Louis I., King of Germany, whom he succeeded, in 876, in the kingdom of Bavaria. He made some partial conquests in Italy. Died 880.

CARLOS, DON, son of Philip II. by his first marriage with Maria of Portugal; born in Valladolid, July 8, 1545. After his recognition as heir to the throne, Don Carlos was sent to study at the University of Alcala de Henares, where, however, he profited so little, that the king, regarding him as unqualified to reign, invited a nephew, the Archduke Rudolf, to Spain, intending to make him heir to the throne. The weak intellect, with vicious and cruel tendencies, which the young prince showed early, may have been due to an injury to his head from a fall down the stairs at Alcala de Henares; or more probably was congenital through the fatal descent from "Juana la loca," and only aggravated by his accident. Excluded from all participation in the government, he early conceived a strong aversion toward the king's confidants, and especially was unwilling that the Duke of Alva should have the government of Flanders. In confession to a priest, on Christmas eve, 1567, he betrayed his purpose to assassinate a certain person; and as the king was believed to be the intended victim, this confession was divulged. The papers of Don Carlos were seized; he was tried and found guilty of conspiring against the life of the king, and of traitorously endeavoring to raise an insurrection in Flanders. The sentence was left for the king to pronounce. Philip declared that he could make no exception in favor of such an unworthy son, but sentence of death was not formally recorded. Shortly afterward he died, July 24, 1568, and was interred in the Dominican monastery, El-Real, at Madrid. The suspicion that he was poisoned or strangled has no valid evidence to support it. The enemies of Philip II. were eager to prove him the murderer of his son, and much has been written on this problem. The version of the story which obtained so much currency through "Don Carlos," the great tragedy of Schiller, was due to the romancing pen of Saint-Real in 1672. Its credibility was shattered first in 1817 by the Spanish writer, Llorente, and in 1829 by the learned Ranke in vol. xlvi. of the "Vienna Year-

book of Literature." The most important contribution to the question since is Gachard's "Don Carlos and Philippe II." (2d ed., Paris, 1867). A new and not unfavorable light on Philip's character as a father has been thrown by the publication of "Letters of Philippe II. to His Daughters" (Paris, 1884), by the same editor.

CARLOS, DON, Duke of Madrid, nephew of Don Carlos of Montemolin, born March 30, 1848. On the death of his uncle (1861) he became head of the CARLISTS (*q. v.*). In 1867 he married the daughter of Duke Charles III. of Parma. In 1872 he issued a manifesto to the Carlist party at Madrid and appeared in the Basque provinces, but was badly defeated at Oroquieta and fled back to France. In 1873 he reappeared in the N. provinces of Spain; captured the stronghold Estella, and had soon overrun Navarre, Catalonia, Aragon, and Valencia, with the exception of the great cities. He was aided with money by all the priests and Legitimists of Europe. By February, 1876, the rebels were hemmed in along the N. coast, and the majority surrendered at Pamplona. He himself fled over the French border, and lived from then on in exile and comparative poverty. He died July 18, 1909.

CARLOS I., King of Portugal, born in 1863, formerly known as Duke of Braganza, son of Luis I. He married, in 1886, Marie Amélie de Bourbon, daughter of the Count of Paris. Immediately after his accession to the throne, in 1889, a revolution broke out in Brazil, which resulted in the overthrow of the empire and the formation of a republic. In the financial straits to which Portugal was reduced in 1892, the King and his family renounced 20 per cent. of their personal revenue, amounting to over \$100,000 per annum. He died Feb. 1, 1908, after having been assassinated, together with his oldest son, Prince Luis, in the streets of Lisbon.

CARLOTTA, (MARIE CHARLOTTE AMÉLIA), ex-empress of Mexico, born in Brussels, June 7, 1840, the daughter of Leopold I. of Belgium. She was married to Maximilian, Archduke of Austria (1857). She accompanied her husband to Mexico in 1864, but in 1866 returned to Europe to solicit aid from the French Emperor and from the Pope. Her failure and the news of her husband's overthrow, unbalanced her mind.

CARLOVINGIANS (kar-lō-vin'yans), the second dynasty of the French or Frankish kings, which supplanted the

Merovingians, deriving the name from Charles Martel or his grandson Charlemagne (that is, Karl or Charles the Great). Charles Martel (715-741) and his son Pepin (741-768) were succeeded by Charlemagne and his brother Carloman (768-771). Charlemagne became sole king in 771, and was succeeded in the Empire of the West by his son Louis le Debonnaire (814). He divided his empire among his sons, and at his death (840) his son Charles the Bald became King of France. He died in 877, and was succeeded by a number of feeble princes. The dynasty came to an end with Louis V., who died in 987.

CARLSBAD, or **KARLSBAD**, a town in Bohemia (Czecho-Slovakia), on the Tepl, near its influx to the Eger, 116 miles W. by N. of Prague. It is widely celebrated for its hot mineral springs, and is frequented in summer by visitors from all parts of Europe. The permanent population numbers about 20,000, who are very industrious, making jewelry, porcelain, and various articles such as are likely to find ready purchasers among the visitors, who in the season—April to October—number from 25,000 to 30,000. Set in most lovely scenery, the town is well built, and offers good accommodation for its guests. The temperature of the hot springs varies from 117° to 167° F. The principal spring, the Sprudel, has a very large volume, and is forced up to a height of three feet from the ground. Altogether, the daily flow of the springs of Carlsbad is estimated at 2,000,000 gallons. The principal ingredient in the water is sulphate of soda. The whole town of Carlsbad appears to stand on a vast caldron of boiling water, which is kept from bursting only by the safety-valves the springs provide. Ascribing its foundation to the Emperor Charles IV. (1347), Carlsbad was made a free town by Joseph I.

CARLSKRONA, or **KARLSKRONA**, the capital of a Swedish province, built on five rocky islets in the Baltic, 240 miles S. S. W. of Stockholm. It was founded in 1680 by Charles XI., who gave it his own name, and made it the great naval station and arsenal of Sweden, instead of Stockholm. It has a magnificent harbor, with a sufficient depth of water to float the largest vessels. The only practicable entrance is strongly defended. Pop. (1919) 27,642.

CARLSRUHE, or **KARLSRUHE** (kär'l's-rö-ë), the capital of the republic of Baden, situated 5 miles E. of the Rhine, and 39 W. N. W. of Stuttgart, 34 S. S. W. of Heidelberg. Founded in

1715, and built in the form of a fan, with 32 streets radiating from the former grand-ducal palace, it has a number of fine buildings—the palace itself (1751-1776), the parliament-house (1845), the theater (1853), the town-hall (1821), the museum (1852), with a library of about 200,000 volumes. Before the palace stands a bronze statue of the city's founder, the Margrave Charles William; and in the market-place is a stone pyramid inclosing his remains. The manufactures include machines of various sorts, engines, locomotives, railway carriages and wagons, jewelry, carpets, chemical products, and cloth. There are numerous educational institutions. During the World War it was bombed several times by Allied aeroplanes. Pop. about 135,000.

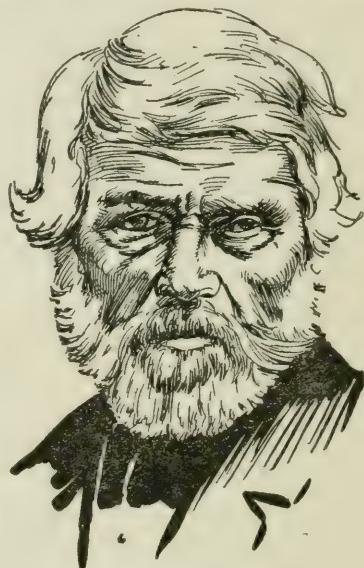
CARLSTADT, or **KARLSTADT**, a fortified town of Croatia, Jugoslavia, on the Kulpa, 32 miles S. W. of Agram by rail. It is the seat of a Greek bishopric, and has a large transit trade. Pop. about 17,500.

CARLSTADT, ANDREAS RUDOLF BODENSTEIN, a German reformer, born in Carlstadt, Franconia, in 1480. He was appointed professor of theology at Wittenberg in 1513. About 1517 he became one of Luther's warmest supporters. He was excommunicated by the bull against Luther, and was the first to appeal from the Pope to a general council. While Luther was at the Wartburg Carlstadt instigated the people and students to the destruction of the altars and the images of the saints, greatly to the displeasure of Luther. In 1524 he declared himself publicly the opponent of Luther, and commenced the controversy respecting the sacrament, denying the bodily presence of Christ in the sacramental elements. This controversy ended in the separation of the Calvinists and Lutherans. After many misfortunes he settled as vicar and professor of theology at Basel, where he died, Dec. 25, 1541.

CARLTON, NEWCOMB, an American capitalist, born in Elizabeth, N. J., in 1869. He graduated from Stevens Institute of Technology in 1890. He practiced as a mechanical engineer from 1891 to 1899, becoming in the latter year director of the works at the Pan-American Exposition. He was appointed vice-president of the Bell Telephone Company of Buffalo from 1902 to 1904, and was vice-president of the Westinghouse Electric & Manufacturing Company. He served this company in various capacities until 1914, when he was appointed president of the Western Union Telegraph Com-

pany. He was a director in many important financial institutions and corporations.

CARLYLE, THOMAS, an English author, born in Ecclefechan, Dumfries-shire, Scotland, Dec. 4, 1795. He was the eldest son of James Carlyle, a mason, afterward a farmer, and was intended for the Church, with which object he was carefully educated at the parish school and afterward at the burgh school of Annan. In his 15th year he was sent to the University of Edinburgh, where he developed a strong taste for mathematics. Having renounced the idea of becoming a minister, after finishing his curriculum (in 1814) he became a teacher for about four years, first at Annan, afterward at Kirkcaldy. In 1818 he removed to Edinburgh, where he supported himself by literary work, devoted much time to the study of German, and



THOMAS CARLYLE

went through a varied and extensive course of reading in history, poetry, romance, and other fields.

His first literary productions were short biographies and other articles for the "Edinburgh Encyclopædia." His career as an author may be said to have begun with the issue in monthly portions of his "Life of Schiller" in the London Magazine, in 1823, this work being enlarged and published separately in 1825. In 1824 he published a translation of Legendre's "Geometry," with an essay on proportion by himself prefixed. The same year appeared his translation

of Goethe's "Wilhelm Meister's Apprenticeship." He was next engaged in translating specimens of the German romance writers, published in four volumes in 1827. In 1827 he married Miss Jane Bailie Welsh, daughter of a doctor at Haddington, and a lineal descendant of John Knox. After his marriage he resided for a time in Edinburgh, and then withdrew to Craigenputtock, a farm in Dumfriesshire belonging to his wife. Here he wrote a number of critical and biographical articles for various periodicals, and here was written "Sartor Resartus," the most original of his works. The writing of "Sartor Resartus" seems to have been finished in 1831, but the publishers were shy of it, and it was not given to the public till 1833-1834, through the medium of "Fraser's Magazine."

The publication of "Sartor" soon made Carlyle famous, and on his removal to London early in 1834 he became a prominent member of a brilliant literary circle embracing John Stuart Mill, Leigh Hunt, John Sterling, Julius Charles and Augustus William Hare, F. D. Maurice, etc. He fixed his abode at Cheyne Row, Chelsea, where his life henceforth was mainly spent. His next work of importance was on the "French Revolution," published in 1837. About this time and in one or two subsequent years, he delivered several series of lectures, the most important of these, "On Heroes and Hero-worship," being published in 1840. "Chartism," published in 1839, and "Past and Present," in 1843, were small works bearing more or less on the affairs of the time. In 1845 appeared his "Oliver Cromwell's Letters and Speeches, with Elucidations," a work of great research, and brilliantly successful in vindicating the character of the great Protector. In 1850 came out his "Latter-day Pamphlets." This work was very repulsive to many from the exaggeration of its language, and its advocacy of harsh and coercive measures. He next wrote a life of his friend, John Sterling, published in 1851, and regarded as a finished and artistic performance.

The largest and most laborious work of his life, "The History of Friedrich II. of Prussia, called Frederick the Great," next appeared, the first two volumes in 1858, the second two in 1862, and the last two in 1865, and after this time little came from his pen. In 1866, having been elected Lord Rector of Edinburgh University, he delivered an installation address to the students "On the Choice of Books." While still in Scotland the sad news reached him that his wife had died suddenly in London. This was a severe

blow to Carlyle. Mrs. Carlyle, besides being a woman of exceptional intellect, was a most devoted and affectionate wife. From this time his productions were mostly articles or letters on topics of the day. Toward the end of his life he was offered a government pension and a baronetcy, but declined both.

He left the estate of Craigenputtock to the University of Edinburgh, settling that the income from it should form ten bursaries to be annually competed for—five for proficiency in mathematics and five for classics (including English). He had appointed James Anthony Froude his literary executor, who, in conformity with his trust, published "Reminiscences of Thomas Carlyle" (1881); "Thomas Carlyle: the First Forty Years of His Life" (1882); "Letters of Jane Welsh Carlyle" (1883); and "Thomas Carlyle: Life in London" (1884). Carlyle died in Chelsea, Feb. 5, 1881.

CARMAGNOLE (kär-man-yō'la), a dance accompanied by singing. Many of the wildest excesses of the French revolution of 1792 were associated with this dance. It was afterward applied to the bombastic reports of the French successes in battle. The name was also given to a sort of jacket worn as a symbol of patriotism.

CARMAN, (WILLIAM) BLISS, a Canadian poet, born in Fredericton, N. B., April 15, 1861. He was educated at the University of New Brunswick, University of Edinburgh, and Harvard University. His first publication, "Low Tide on Grand Pré: A Book of Lyrics" (1893), had a very favorable reception. Other volumes of his collected poems are: "Songs from Vagabondia" (1894); "Behind the Arras: A Book of the Unseen" (1895); "More Songs from Vagabondia" (1896); "Last Songs from Vagabondia" (1900); "Pipes of Pan" (1902-1905); "Daughters of Dawn" (1912); "Echoes from Vagabondia" (1912); "April Airs" (1916); etc. His poems frequently appear first in American magazines and other periodicals.

CARMARTHENSHIRE, a county of south Wales. It is on the Bristol Channel and has an area of 918 square miles, about one-third of this being waste land. The chief industry is the mining of coal, copper, lead, and iron. Cattle-raising is also an important industry, and there are manufactures of woolen goods. The principal towns are Carmarthen, the county town, Llanelli, Newcastle, and Kidwelly. Pop. about 165,000.

CARMEL, a range of hills in Palestine, extending from the Plain of Esdraelon to the Mediterranean, and termi-

nating in a steep promontory on the S. of the Bay of Acre. It has a length of about 16 miles, and its highest point is 1,850 feet above the sea. Knights of Mount Carmel, an order of 100 knights, each of whom could prove at least four descents of nobility by both father and mother, instituted by Henry IV. of France.

CARMELITE, an order of mendicant friars and nuns, who wear a scapulary, or small woolen habit of a brown color, thrown over the shoulders. They claim to be in direct succession from Elijah, but their real founder was Berthold, a Calabrian, who, with a few companions, migrated to Mount Carmel about the middle of the 12th century, and built a humble cottage with a chapel, where he and his associates led a laborious and solitary life. In 1209, Albert, patriarch of Jerusalem, gave the solitaries a rigid rule, containing articles, and enjoining the most severe discipline. After their establishment in Europe, their rule was in some respects altered, the first time by Pope Innocent IV., and afterward by Eugenius IV. and Pius II. The order is divided into two branches, viz., the Carmelites of the ancient observance, called moderate or mitigated, and those of the strict observance, who are known as the barefooted Carmelites. There are about 500 Carmelite nunneries and convents.

CARMEN SYLVA, the pen-name of Elizabeth, Queen of Rumania, born Dec. 29, 1843; the daughter of Prince Hermann of Wied-Neuwied, and Maria of Nassau; married King (then Prince) Charles of Rumania in 1869. Her only child, a daughter, died in 1874, and out of this great sorrow of her life arose her literary activity. Two poems, printed privately at Leipsic in 1880 under the name "Carmen Sylva," were followed by "Storms" (1881); "Leiden's Erdengang" (1882); translated into English as "Pilgrim Sorrow" (1884); "Jehovah" (1882); "Ein Gebet" (1882); "Thoughts of a Queen" (1882); etc. Many of the translations in "Rumanian Poetry" (1881) are from her pen. Another book, in which she worked into literary form many native traditions of her adopted country, is "Pelesch-Märchen" (1883). In the war of 1877-1878, as *muma ran-tilor* ("mother of the wounded"), she endeared herself to her people by her devotion to the wounded soldiers, and since that time she diligently fostered the national women's industries. She died at Bucharest on March 2, 1916.

CARMINATIVE, a substance which acts as a stimulant to the stomach, caus-

ing expulsion of flatulence, also allaying pain and spasm of the intestines. They generally contain a volatile oil; most of the ordinary condiments, as pepper, mustard, ginger, cinnamon, cloves, nutmeg, oil of peppermint, etc., are carminative. They are used in cases of distension, and colic of the stomach, or intestines from flatulence, also as adjuncts to purgatives to prevent griping, and to promote digestion in cases of atonic dyspepsia.

CARMINE, the fine red coloring matter or principle of cochineal, from which it is prepared in several ways, the result being the precipitation of the carmine. It is used to some extent in dyeing, in water-color painting, to color artificial flowers, confectionery, etc.

CARMONA, a town of Andalusia, Spain, 27 miles E. N. E. of Seville by rail, is picturesquely situated, and commands an imposing view of the valley of the Guadalquivir. Julius Caesar speaks of Carmo or Carmona as "by far the strongest city of the whole province of further Spain." Recent important excavations on the site of the ancient necropolis, to the W. of the modern town, have brought to light a large number of tombs and funeral triclinia in almost perfect preservation. Considerable portions of the Moorish wall and Alcazar still remain.

CARNAC, a village of Brittany, France, department of Morbihan, on a height near the coast, 15 miles S. E. of Lorient, and remarkable for the so-called Druidical monuments in this vicinity. These consist of 11 rows of unhewn stones, which differ greatly both in size and height, the largest being 22 feet above ground, while some are quite small. These avenues originally extended for several miles, but many of the stones have been cleared away for agricultural improvements. They are evidently of very ancient date, but their origin is unknown.

CARNARVON, HENRY HOWARD MOLYNEUX HERBERT, EARL OF, born June 24, 1831; was educated at Eton and Christ Church, Oxford. Conservative in 1866, he accepted from Lord Derby the office of Colonial Secretary. As such he had moved the second reading of an important bill for the confederation of the British North American colonies, when, with the future Marquis of Salisbury, he resigned office upon the Reform Bill of 1867, which he regarded as democratic and dangerous. On Disraeli's return to power in 1874, Lord Carnarvon resumed office as Colonial Secretary, once more, however, to resign in 1878. During the brief Conserv-

ative administration of 1885-1886 he was Lord-Lieutenant of Ireland. He was author of "The Druses of Mount Lebanon" (1860), "Reminiscences of Athens and the Morea" (1869), and translations of the "Agamemnon" (1879), and the "Odyssey" (1886). He died June 28, 1890.

CARNARVONSHIRE, a county in the northern part of Wales. It has an area of 565 square miles, of which one-half is pasture land. The surface in general is mountainous. There are important mines of copper, lead, zinc, and coal. Dairying is the chief agricultural industry. The principal towns are Carnarvon, the county seat; Bangor, and Conway. Pop. about 130,000.

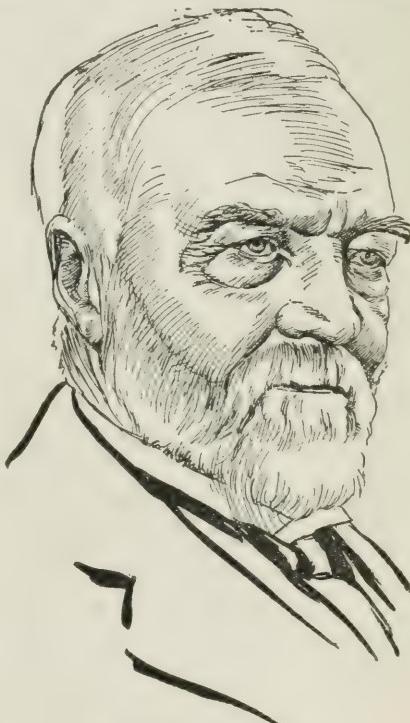
CARNATIC, a region on the E. or Coromandel coast of India, now included in the presidency of Madras, extending inland to the Eastern Ghats, and lengthwise from Cape Comorin to 16° N. It extended for about 600 miles along the E. coast, and from 50 to 100 miles inland. The name Karnataka was originally applied by its Mohammedan conquerors to Mysore and the country above the Ghats. In course of time the same term has come to be applied exclusively to the country below the Ghats. The Carnatic is no longer an administrative division, but is memorable as the theater of the struggle between France and England for supremacy in India.

CARNATION, the popular name of varieties of *Dianthus Caryophyllus*, the clove-pink. The carnations of the florists are much prized for the beautiful colors of their sweet-scented, double flowers. They are arranged into three classes according to color, viz., *bizarres*, *flakes*, and *picotees*.

CARNAUBA, the Brazilian name of the palm *Corypha cerifera*, which has its leaves coated with waxy scales, yielding by boiling a useful wax. The fruit and pith are eaten, the leaves are variously employed, and the wood in building.

CARNEGIE, a borough of Pennsylvania, in Allegheny co. It is on the Pittsburgh, Cincinnati, Chicago, and St. Louis, the Pittsburgh, Chartiers, and Youghiogheny, and the Wabash Pittsburgh Terminal railroads. Its chief industry is the manufacture of steel and it is also an important coal-mining center. In addition there are manufactures of lead, stoves, and granite ware. The city has a public library, Elks' Home, orphan asylum, high school, and other public buildings. Pop. (1910) 10,009; (1920) 11,516.

CARNEGIE, ANDREW, an American manufacturer and philanthropist, born in Dunfermline, Scotland, Nov. 25, 1837. He came to the United States in 1848, settled in Pittsburgh, became a telegraph operator and later a railroad superintendent. During the Civil War he served the Government as superintendent of military railways and telegraph lines in the East, and after the conflict was over established great iron works at Pittsburgh, with which city his business interests have been chiefly iden-



ANDREW CARNEGIE

tified. He introduced the Bessemer process of making steel in 1868. The extensive industries that he controlled were consolidated in 1889 into the Carnegie Steel Company, the largest plant of its kind in the country. In 1901 his interests were bought and merged by J. P. Morgan into the United States Steel Corporation. Mr. Carnegie then retired from business and devoted himself entirely to philanthropic and social welfare purposes. Up to June 1, 1918, he had given away \$350,000,000. Over \$60,000,000 of this amount was expended in the construction of 2,811 public libraries, while many more millions were devoted to their endowment. His benefac-

tions were not confined to the United States, for many millions were expended in Great Britain, especially his native Scotland. He wrote several books, of which the best known are: "Round the World" (1884); "Triumphant Democracy" (1886); "Gospel of Wealth" (1900); "The Empire of Business" (1902); and "Problems of To-day" (1908). He died at Lenox, Mass., Aug. 11, 1919. (See titles directly following.)

CARNEGIE ENDOWMENT FOR INTERNATIONAL PEACE, an institution founded and endowed by Andrew Carnegie for promoting peace among the nations of the world. Ten million dollars were set aside as an endowment in 1910. Mr. Carnegie had been keenly interested in the Hague Tribunal, for which he had offered to provide a building at his own expense. In the deed of gift for the Endowment he told the trustees, Dec. 14, 1910, that the funds "are to be administered by you to hasten the abolition of international war, the foulest blot upon our civilization." Some of the most distinguished men in the country had been selected as trustees.

The outbreak of the World War in 1914 prevented the carrying out of the work of the Endowment. Once the war was on, however, the trustees did not hesitate to advocate the overthrow of Germany. On April 20, 1917, they warmly indorsed the act of the President in declaring war and appropriated half a million dollars for the purpose of reconstructing the devastated homes of Belgium, France, Serbia, and Russia.

CARNEGIE FOUNDATION, an institution which aims to help the teaching force in higher institutions of learning by providing allowances on retirement from active service. The full name of the organization is the Carnegie Foundation for the Advancement of Teaching. It came into existence April 16, 1905, and \$10,000,000 was provided by Mr. Carnegie as funds for the institution. Care was taken that only higher institutions of learning should participate in the advantages offered by the fund.

The Foundation during the period of its existence has distributed many millions of dollars in pensions. Changes have been made from time to time in the management of the work by the trustees, one of these changes involving a certain contribution by the teachers to an insurance and annuity plan. In 1920 the permanent endowment of sixteen and a quarter million dollars had been approximately doubled by the setting aside of one million dollars of accumulated surplus and the receipt of eleven million dollars in new funds to be used in termi-

nating the old pension system of the Foundation, and two million dollars for the inauguration of a new plan. Over six and a half million dollars had been distributed to professors and their widows under the old plan, and the Foundation has provided for the distribution of sixty million dollars for the retirement of the six thousand teachers who were in the associated institutions in 1915.

CARNEGIE HERO FUND, a fund created by Andrew Carnegie in 1904 to provide rewards for those who perform deeds of heroism, and in case of their death to provide for their widows and dependents. The endowment of the fund is \$5,000,000, the income of which is used for the purpose specified by the donor. The awards are carefully hedged about with provisions to insure that only those receive them who are entitled to do so. The expenditure of the fund is directed by a commission of Mr. Carnegie's own naming. Medals are awarded and grants are made only when the facts concerning any alleged acts of heroism are fully attested. The medals are of gold, silver, or bronze, in accordance with the degree of bravery or self-sacrifice shown by the recipient. On each medal is set forth the circumstances under which the heroic act was performed. A recapitulation of the work done in connection with the Fund from the date of its establishment up to 1920 shows that 1,527 medals had been awarded. Of these, 18 were gold, 456 silver and 1,053 bronze. To heroes and their dependents \$1,834,521.97 had been paid. The pensions in force up to Nov. 1, 1919, amounted to \$99,300 annually. A total of 20,053 cases had been brought to the attention of the Commission. Of these 1,527 had been granted, 17,826 had been refused and 700 were pending. In addition to the distinct purpose for which the Fund had been created, \$169,462 had been given to sufferers from disasters from storm, earthquake, etc. Since the creation of the American Fund, Mr. Carnegie has established similar funds in Great Britain and Ireland, France, Germany, Belgium, Holland, Sweden, Switzerland, Italy, Norway, and Denmark.

CARNEGIE INSTITUTE OF TECHNOLOGY, an institution for scientific education, founded in Pittsburgh, Pa., by Andrew Carnegie, in 1900. It was originally known as the Carnegie Technical Schools, and in 1912 received its present title. Mr. Carnegie originally endowed the institution with \$1,000,000, but increased the gifts until they reached a total of \$4,000,000 for buildings and \$7,000,000 for endowments. The institu-

tion is situated in Schenley Park, about 3 miles from the business center of Pittsburgh. It is composed of 4 separate schools: a School of Applied Science, a School of Applied Design, a School for Applied Industries, and the Margaret Morrison Carnegie School for Women. Tuition fees are extremely moderate. In 1919 there were 3,150 students, with 212 instructors. President, A. A. Hamer-schlag.

**C A R N E G I E I N S T I T U T I O N O F
W A S H I N G T O N**, an educational institution founded by Andrew Carnegie in 1902, with an endowment of \$10,000,000, to which original sum the giver later on added \$12,000,000. The articles of incorporation state that "the objects of the corporation shall be to encourage in broadest and most liberal manner investigation, research, and discovery, and the application of knowledge to the improvement of mankind." Provision is made for a dissemination of the results achieved, by the publication of brochures and bulletins from time to time. The institution is under the control of 24 trustees, who meet annually to study the progress of the work on hand and the initiation of such new projects as may seem to them desirable. In the intervals between meetings, the affairs of the institution are carried on by an executive committee. Its publications have been widely disseminated among the libraries of the world.

C A R N E L I A N, or **C O R N E L I A N**, a reddish variety of chalcedony, generally of a clear, bright tint; it is sometimes of a yellow or brown color and sometimes white. It is largely used for engraving seals. It is found principally at Cambay, in Gujarat, India, and Tampa Bay, Fla.

C A R N I O L A, a former province of the Austrian empire. It has an area of 3,856 square miles. It is bounded by Croatia on the E. and S., by Carinthia on the N., Styria on the N. E., and Istria and Gorz on the W. It is a mountainous region and not very productive except in certain districts, where wheat, barley, wine, flax, and fruits are produced in considerable quantities. Its mineral resources are rich, the mines yielding lead, quicksilver, and iron. There are also valuable quarries of marble, and coal exists in paying quantities. The chief manufactures are iron, linen, lace, flannel, leather, worsted, and woolen cloth. The railway facilities are excellent, there being nearly three hundred miles of line in the province. Laibach is the capital and principal city (pop. about 40,000). Ninety-four per

cent. of the people are of Slovene birth and the remaining six per cent. is made up of Germans, Serbs, Croats, and Italians. The prevailing faith is Roman Catholic. In the 12th century Carniola was a duchy of the Counts of Tyrol. It was allotted to France in the treaty of Vienna and became a part of the kingdom of Illyria. By the terms of the Versailles treaty it was made a part of the new kingdom of Jugoslavia. Pop. about 530,000.

C A R N I V A L, the festival celebrated in Roman Catholic countries, and especially at Rome and Naples, with great mirth and freedom during the week before the beginning of Lent. In the United States carnivals are annually celebrated at various places. That at New Orleans, known as *Mardi Gras*, is especially spectacular, the festivities being prolonged three days and attracting thousands of visitors.

C A R N I V O R A, a principal division of the flesh-eating *Mammalia*. The name is given to those animals, including the feline, canine, and ursine families, which have their teeth peculiarly fitted for the mastication of animal matter. The clavicles are rudimentary, or wanting. They are divided into two great groups, or sub-orders, one terrestrial, the other aquatic. The first is the group of the *Fissipedia*, or "split-feet," so called from the fact that their feet are divided into well-marked toes; the second is the group of *Pinnipedia*, or "fin-feet" (seals, etc.), so called because the toes are bound together by skin-forming fins or flappers rather than feet. Another classification is into three sections or tribes—(1) *Pinnigrada*, or *Pinnipedia*, examples, the Seals and Walruses; (2) *Plantigrada*, example, the Bear, and (3) *Digitigrada*, examples, the Cat and the Dog.

C A R N O T, **L A Z A R E N I C O L A S M A R -
G U E R I T E**, a French statesman, general, and strategist, born in Burgundy, May 13, 1753. In 1791 he was appointed deputy to the constituent assembly. In the following March he was sent to the Army of the North, where he took command and successfully repulsed the enemy. On his return he was made member of the Committee of Public Safety, and directed and organized the French armies with great ability and success. As a member of the Committee Carnot was formally responsible for the decrees of Robespierre, but being incessantly occupied in his department knew really little of the atrocities to which the sanction of his name was lent. In 1797 Carnot, having unsuccessfully opposed Bar-

ras, had to escape to Germany, but returned, and was appointed Minister of War by Napoleon (1800). But he remained in principle an inflexible Republican, voted against the consulship for life, and protested against Napoleon's assumption of the imperial dignity. For seven years after this Carnot remained in retirement, publishing several valuable military works. In 1814 Napoleon gave him the chief command at Antwerp, and in 1815 the post of Minister of the Interior. After the Emperor's second fall he retired from France. He died in Magdeburg, Prussia, Aug. 3, 1823.

CARNOT, MARIE FRANÇOIS SADI, President of the French Republic, born in Limoges, Aug. 11, 1837; a grandson of the famous war-minister of the Revolution. He was educated at the Ecole Polytechnique and the Ecole des Ponts et Chausées, Paris. He was assigned to duty in the engineer corps. During the siege of Paris in 1871 he was made prefect of the Seine-Inférieure and showed great ability. In politics he was an earnest Republican. Elected to the National Assembly in 1871 by the Côte-d'Or, he soon rose to prominence. In 1876 he was chosen secretary of the Chamber of Deputies; in 1878 Secretary of Public Works. He was Minister of Public Works in 1881-1882 and 1886. In December, 1887, on the resignation of M. Grévy he was chosen President. The policy which he announced in his inaugural message, and which was consistently and successfully carried out during his administration, was one of peace with foreign nations, careful development of the army and navy, and economy in all departments. The support and confidence of the Conservative Republicans fortified him against the Socialists, the Anarchists, and the supporters of Boulanger. An attempt to involve his name in the Panama scandal failed utterly. While attending an exposition at Lyons, June 24, 1894, he was stabbed by a fanatical Italian Anarchist, and died the next day.

CAROL, a song of praise sung at Christmas-tide. It originally meant a song accompanied with dancing, in which sense it is frequently used by the old poets. It appears to have been danced by many performers, by taking hands, forming a ring, and singing as they went round. Bishop Taylor says that the oldest carol was that sung by the heavenly host when the birth of the Saviour was announced to the shepherds on the plains of Bethlehem. It is probable that the practice of singing carols at Christmas-tide arose in imitation of this, as the majority of the carols de-

clared the good tidings of great joy; and the title of Noels, nowells, or novelles, applied to carols, would seem to bear out this idea. Carol singing is of great antiquity among Christian communities, as the carol by Aurelius Prudentius, of the 4th century, will show.

CAROLINA MARIE, Queen of Naples; daughter of Francis I. and Maria Theresa of Austria; born Aug. 13, 1752. She married Ferdinand IV. of Naples in 1768. Under her influence Ferdinand declared war against France in 1798. The French advanced upon Naples and she fled with her husband to seek protection at the hands of the English. She subsequently returned to Naples, but for conspiring against Napoleon was again driven into exile. She died in Vienna, Sept. 8, 1814.

CAROLINE AMELIA ELIZABETH, Queen of England; daughter of the Duke of Brunswick-Wolfenbüttel; born May 17, 1768. In 1795 she was married to her cousin the Prince of Wales, afterward George IV. The marriage was not to his liking, and after the birth of the Princess Charlotte he separated from her. Many reports were circulated against her honor, and a ministerial committee was formed to inquire into her conduct. But the people in general sympathized with her, regarding her as an ill-treated wife. In 1814 she made a journey through Germany, Italy, Greece, etc., to Jerusalem, in which an Italian, Bergami, was her confidant and attendant. When the Prince of Wales ascended the throne in 1820 he offered her an income of £50,000 on condition that she would never return to England. She refused, and in June of the same year entered London amid public demonstrations of welcome. The government now instituted proceedings against her for adultery, but the public feeling and the splendid defense of Brougham obliged the ministry to give up the divorce bill after it had passed the lords. Though banished from the court, the queen then assumed a style suitable to her rank. She died Aug. 7, 1821.

CAROLINE ISLANDS, a group in the western Pacific, lying between the Marshall and Pelew islands, with an area of about 270 square miles, and a population of some 22,000; but the Pelew (*q.v.*) group is generally included in the Caroline Archipelago (area, 560 square miles; pop. 36,000), which thus stretches across 32° of lon. and 9° of lat. There are some 500 small atolls in the archipelago, but three-fourths of both area and population are included in the five volcanic islands of Babelthouap, Yap,

Rouk, Ponapé (Ascension), and Kusari (Strong Island); these are all fertile and well watered, and many of the low-lying lagoons, though less so, are well wooded and to some extent inhabited. The climate is moist, but not unhealthy, and is tempered by cooling breezes. The people belong to the brown Polynesian stock, are strongly built, and are gentle, amiable, and intelligent; they are bold sailors, and carry on a brisk trade with the Ladrones to the N. where they have several settlements. Besides the usual products of the Polynesian islands, copra has been largely exported. The islands were discovered in 1527 by the Portuguese, and called Sequeira; in 1686 they were annexed and rechristened in honor of Charles II. by the Spaniards, who, however, shortly changed the name to New Philippines. After the failure of several missionary attempts in the 18th century, Spain took little active interest in the group, until August, 1885, when the German flag was hoisted on Yap. The sharp dispute which followed was submitted to the Pope as arbitrator, who decided in favor of Spain, but reserved to Germany special trade privileges. In 1887 disturbances broke out at Ponapé, in which the governor, who had arrested one of the American Protestant missionaries, was killed by the natives; but the rising was shortly put down. In February, 1899, Germany purchased from Spain the Caroline and Pelew islands, and all of the Ladrones excepting Guam, which had been ceded to the United States in the treaty of peace. The islands were captured by an Australian force on Sept. 14, 1914, and by the Treaty of Versailles are administered by Japan as mandatory.

CAROLUS DURAN. See DURAN, CHARLES.

CAROTID (kar-ot'id), the name of an artery on each side of the neck. The common carotids are two considerable arteries that ascend on the fore part of the cervical vertebra to the head to supply it with blood. The right common carotid is given off from the *arteria innominata*; the left arises from the arch of the aorta.

CARP, a fresh-water fish, *Cyprinus cyprio* (Linn.), the type of the family *Cyprinidae*. It is a native of Asia, but has been extensively introduced into Europe and the United States, especially in the latter, where it has been widely distributed by the Federal fish commissioners. It is often bred in ponds.

CARPATHIAN MOUNTAINS (German, *Karpathen*), a range of mountains in southern Europe, mostly in former

Austria-Hungary, forming a semicircular belt of nearly 800 miles in length. As a result of the peace treaty between the Entente powers and Austria-Hungary, they belong now chiefly to the republics of Czechoslovakia and Poland, forming part of the new frontiers of these two states. The most southern portion, located in Bukowina, belongs to Rumania. The Carpathian chain may be divided into two great sections—the West Carpathians, to the N. W., and the East Carpathians, to the S. E., with lower ranges stretching between. To the Western Carpathians belongs the remarkable group of the Tátra. The greatest height of the East Carpathians is Ruska-Poyana, 9,909 feet; of the West Carpathians, the Eisthalerspitze, 8,521 feet; many other peaks have an elevation of over 8,000 feet. The only important rivers which actually rise in the chain are the Vistula, the Dniester, and the Theiss. The Carpathian range is rich in minerals, including gold, silver, quicksilver, copper, and iron. Salt occurs in beds, which have sometimes a thickness of 600 or 700 feet. On the plateaux corn and fruit are grown to the height of 1,500 feet. Higher up the mountain steeps are covered with forests of pine. Numerous passes cross the range, and there is much remarkable scenery. Much of the most severe fighting during the World War between the Russian and Austro-German armies occurred in the Carpathian Mountains. See WORLD WAR.

CARPEL, a leaf forming the pistil. Several carpels may enter into the composition of one pistil.

CARPENTARIA, GULF OF, a large gulf on the N. coast of Australia, having Cape York Peninsula, the N. extremity of Queensland, on the E., and Arnhem Land on the W.

CARPENTER, FRANCIS BICKNELL, an American painter, born in Homer, N. Y., Aug. 6, 1830. He studied with Sanford Thayer at Syracuse, N. Y. (1844), and in 1852 became an associate of the National Academy. The best known of his works is the "Emancipation Proclamation" (1864), in the capitol at Washington. While executing the last-named painting he was closely associated with President Lincoln, and his observations during this period are embodied in his book entitled "Six Months in the White House with Abraham Lincoln." He died in New York City, May 23, 1900.

CARPENTRY, the art of combining pieces of timber to support a weight or sustain pressure. The work of the carpenter is intended to give stability to

a structure, that of the joiner is applied to finishing and decoration.

CARPET, a thick fabric, generally composed wholly or principally of wool, for covering the floors of apartments, staircases, and passages in the interior of a house. They were originally introduced from the East, where they were fabricated in pieces, like the modern rugs, for sitting on—a use obviously suggested by the Eastern habit of sitting cross-legged upon the floor. Eastern carpets are still highly thought of. The Persian, Turkish, and Indian carpets are all woven by hand, and the design is formed by knotting into the warp tufts of woolen threads of the proper color. Of carpets made in the United States and Europe Brussels carpet is a common and highly-esteemed variety. It is composed of linen thread and worsted, the latter forming the pattern. The linen basis does not appear on the surface, being concealed by the worsted, which is drawn through the reticulations and looped over wires that are afterward withdrawn, giving the surface a ribbed appearance. Wilton carpets are similar to Brussels in process of manufacture, but in them the loops are cut open by using wires with a knife-edge, and the surface thus gets a pile. Tapestry carpets have also a pile surface. They are made in a manner similar to that in which Brussels and Wilton carpets are manufactured; but only one yarn is used instead of five or more of different colors, as in the carpets just named. The Kidderminster or Scotch carpet consists of two distinct webs woven at the same time and knitted together by the woof. The pattern is the same on both sides of the cloth, but the colors are reversed. An improvement upon this is the three-ply carpeting, made originally at Kilmarnock. The original Axminster carpets were made on the principle of the Persian or Turkish carpets. Axminster carpets, made in one piece to suit the size of the room, have a fine pile, which is produced by using chenille as the weft, the projecting threads of which form the pile, which is dyed before being used. Carpets of felted wool, with designs printed on them, are also used, and are very cheap. Philadelphia is the leading carpet-manufacturing city in the United States.

CARPET-BAGGER, a needy or other political adventurer who goes about the country pandering to the prejudices of the ignorant with the view of getting into place or power, so called because regarded as having no more property than might fill a carpet-bag. Originally applied to needy adventurers of the

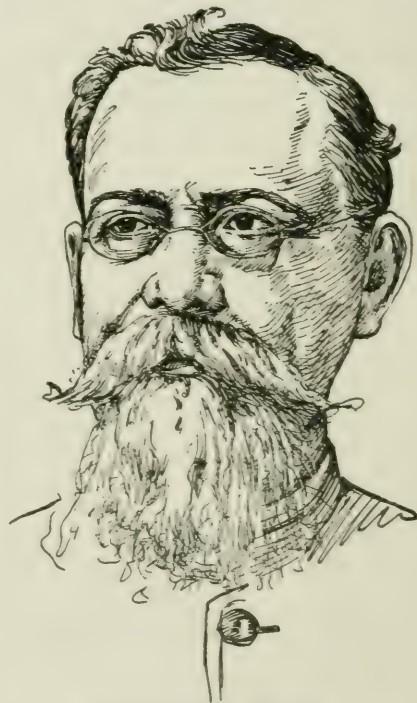
Northern States, who tried in this way to gain the votes of the negroes of the Southern States after the close of the Civil War.

CARPET SWEEPER. See VACUUM CLEANER.

CARPOCRATES (kär-pok'rā-tēz), a native of Alexandria, who in the 2d century revived several Gnostic errors. He rejected the Old Testament and the gospels of St. Matthew and St. Luke; denied the resurrection of the dead, and advocated the most licentious mode of life.

CARPUS, the name applied by anatomists to the wrist, which is made up of eight little bones, of different figures and thickness, placed in two ranks, four in each rank. They are strongly tied together by the ligaments which come from the radius, and by the annular ligament.

CARRANZA, VENUSTIANO, Mexican President; born in Cuatro Ciénelas, State of Coahuila, Mexico, Dec. 29, 1859.



VENUSTIANO CARRANZA

His parents were wealthy landholders. He was educated in the public schools of his own State and afterward studied law in Mexico City. His eyes were weak, however, and he abandoned the practice

of law and returned home to become a rancher. He became prominent in politics and after having served as Judge and Senator became Governor of Coahuila in 1911. He was in the cabinet of President Madero as Secretary of War for a short period and after the assassination of the latter took up arms against Huerta. His forces were swelled by the accession of Villa, and together they forced the resignation and flight of Huerta. Carranza entered Mexico City in triumph, proclaimed himself "First Chief of the Revolution." Quarrels ensued with Villa and an open break took place Sept. 23, 1914, when Villa declared war on Carranza. The latter's forces were victorious and Villa was driven into northern Chihuahua and eastern Sonora. In the meantime a Constitutional Congress had been called and on March 11, 1917, Carranza was elected President of Mexico. During his administration his attitude toward the United States was unfriendly and at times hostile, and several times this country was brought close to the brink of intervention. In 1920 a revolution was started against him on the suspicion that he was planning to manipulate the forthcoming presidential election in favor of Bonillas, one of the candidates. Carranza was forced to flee from the capital and was assassinated on May 22, 1920. See MEXICO.

CARRARA, a town of Italy, in the province of Massae Carrara, on the Lavensa, about four miles from the Mediterranean, and 60 W. N. W. of Florence. An academy of sculpture is established here and several artists have their residence, attracted by the convenience of obtaining marble almost cost-free; and the sale of rude marble and of sculptured articles forms an important branch of traffic. The famous Carrara marble is a white saccharine limestone, which derives its value from its texture and purity. The quarries have been wrought from the age of Augustus, and seem to be now as inexhaustible as ever. Pop. about 50,000.

CARREL, ALEXIS, a Franco-American surgeon; born at Sainte-Foy les Lyons, France, June 28, 1873. He was connected with French hospitals until 1905, when he came to the United States. Since 1909 he has been a member of the Rockefeller Institution for Medical Research. He was awarded the Nobel prize in 1912, for success in suturing blood vessels and transplantation of human organs. During the World War his treatment of wounds had extraordinary success and made him an international figure. He stands in the very foremost

rank in his profession. He published a large number of papers, chiefly brief reports of his scientific investigations.



DR. ALEXIS CARREL

CARREL, NICHOLAS ARMAND, a French writer, born in Rouen, May 8, 1800. For some years he was an officer in the army, but later settled in Paris, and acquired a reputation as an essayist and contributor to the leading opposition papers. In 1830 he united with Thiers and Mignet in editing the "National," which soon rose to be the leading newspaper in opposition to the government of Charles X. After the revolution his colleagues joined the government of Louis Philippe, and he was left with the chief direction of the paper, which still continued in opposition. In 1832 the "National" became openly Republican, and enjoyed great popularity. Carrel was killed July 24, 1836, in a duel with Emile de Girardin.

CARREÑO, TERESA (kär-ān'yō), a Venezuelan pianist, born in Caracas, Dec. 22, 1853. She was a pupil of Gottschalk and made her début in Europe in 1865. She made many successful tours in Europe and in the United States. She died in 1917.

CARRÈRE, JOHN MERVEN, an American architect; born at Rio de Janeiro, Brazil, Nov. 9, 1858. His parents

were American, but he received his early education in Switzerland. He graduated from the Ecole des Beaux-Arts, Paris, in 1882, came to New York and in 1894 became a member of the firm of Carrère and Hastings. He soon achieved a reputation for the artistic merits of his work. His firm built the Ponce de Leon and Alcazar hotels at St. Augustine, Fla., the Edison Building, New York, and a host of other great structures in various cities of the country. At the time of his death, his firm was erecting the \$8,000,000 Public Library Building in New York, the commission for which they had received in competition with some of the best known architects in the country. He died from an accident, March 1, 1911.

CARRHÆ, the site of an ancient city in northwestern Mesopotamia, the Haran of the Bible.

CARRIAGE, a general name for any vehicle intended for the conveyance of passengers either on roads or railways. Carriages are structures mounted on two or more wheels, and in form, build, and accommodation they are exceedingly diverse. Carriages of one kind or other have existed from immemorial antiquity.

CARRICK, a borough of Pennsylvania, in Allegheny co. It is almost entirely a residential town, but there are in the vicinity important deposits of coal. Pop. (1910) 6,117; (1920) 10,504.

CARRIER, a person, corporation, or vehicle regularly employed in carrying goods, messages, or other articles. Two kinds of carriers are recognized by the law, namely, private carriers and common carriers. Private carriers are persons who, although they do not undertake to transport the goods of all who may choose to employ them, yet agree to carry the goods of some particular person for hire, from one place to another. In such case the carrier incurs no responsibility beyond that of any other bailee for hire, that is to say, the responsibility of ordinary diligence.

Common carriers are persons or companies who undertake for hire to carry goods for the general public from one place to another. A common carrier is bound to provide safe and suitable conveyances, with proper care and management, failing in which he is not exempt from responsibility, though a providential interference (snow, ice, fire, etc.) be the immediate occasion of loss. Carriers are responsible for all losses, except by providential calamity, act of an enemy in time of war, and fault of the shipper. Carriers may limit their responsibility by special contract, but they cannot free

themselves from it wholly, nor escape the duty of ordinary care. If a sender misrepresent the character or value of the goods sent, the carrier is not liable if the goods be stolen. But the sender need not disclose the contents of his package unless asked. Common carriers are responsible for the acts of all their agents. Carriers must deliver goods in as good order as when received. They may refuse to take goods not prepared properly for shipment. They may demand prepayment of freight. If payable at the end of the route, they may hold the goods until payment is made. Baggage may be retained for unpaid fare.

Bills of lading, shipment slips, receipts, etc., usually specify all the conditions on which goods are carried, but the law does not sustain all the announcements thus made. See RAILWAYS.

CARRIER PIGEON, a variety of the common domestic pigeon used for the purpose of carrying messages. Several varieties are thus employed, but what is distinctly called the carrier pigeon is a large bird with long wings, large tuberculated mass of naked skin at the base of the beak, and with a circle of naked skin round the eyes. This variety, however, is rather a bird for show than use, and the variety generally employed to carry messages more resembles an ordinary pigeon. The practice of sending letters by pigeons belongs originally to eastern countries, though in other countries it has often been adopted, more especially before the invention of the electric telegraph. These birds can be utilized in this way only by virtue of what is called their "homing" faculty or instinct, which enables them to find their way back home from surprising distances. The missive may be fastened to the wing or the tail, and must be quite small and attached so as not to interfere with the bird's flight. By the use of microphotography long messages may be conveyed in this way, and such were received by the besieged residents in Paris during the Franco-Prussian War of 1870-1871, the birds being conveyed out of the city in balloons. Seventy-two miles in two and a half hours, and 180 in four and a half, have been accomplished by carrier pigeons. Large numbers of these birds are now kept in England, Belgium, France, etc., there being numerous pigeon clubs which hold pigeon races to test the speed of the birds. These pigeons are also kept in several European countries for military purposes. In the United States there are numerous homing clubs, formed for breeding, training, racing, and exhibiting carrier pigeons.

CARRINGTON, HENRY BEEBEE, an American military officer, born in Wallingford, Conn., March 2, 1824; graduated at Yale in 1845. He began the practice of law in Columbus, O., in 1848, and took an active part in the anti-slavery movement. In 1857 he was on the staff of Governor Chase and helped to organize the State militia in preparation for war. In 1861 he was appointed colonel of the 18th United States Infantry, served through the war, and afterward was in service on the plains till 1869; was retired in 1870; Professor of Military Science and Tactics in Wabash College, Ind., till 1873. He wrote "Absaraka, Land of Massacre," "Battles of the American Revolution," and "Battle Maps and Charts of the American Revolution." He died in 1912.

CARRION-FLOWERS, a common name for species of the genus *Stapelia* (natural order *Asclepiadaceæ*), so called because of their putrid odor. In the United States the name is also given to the *Smilax herbacea*, a liliaceous plant.

CARROLL, CHARLES, the last surviving signer of the Declaration of American Independence, born in Annapolis, Md., Sept. 20, 1737. He studied at Paris, became a member of the Inner Temple at London, returned to his native country in 1764, was elected to Congress in 1775, and, along with the other members, signed the Declaration on Aug. 2 of the following year. In 1804 he withdrew to private life at Carrollton, his patrimonial estate, where, as his life advanced, he became an object of universal veneration. He survived by six years all the other signers of the Declaration, and died in Baltimore, Nov. 14, 1832.

CARROLL, JOHN, cousin of Charles Carroll, and first Roman Catholic bishop in the United States; born in Upper Marlboro, Md., Jan. 8, 1735; sent for education at the age of 13 to Flanders. From St. Omer's, where he remained six years, he was transferred to the colleges of Liège and Bruges. He was ordained a priest and became a Jesuit. In 1775 he returned to America, and engaged in the duties of a parish priest. In 1786 he was appointed vicar-general, and settled at Baltimore. In 1790 he was consecrated, in England, Catholic bishop of the United States, and returned with the title of Bishop of Baltimore. He founded Georgetown College in 1791. A few years before his death he was created archbishop. He died in Georgetown, D. C., Dec. 3, 1815.

CARROLL, LEWIS. See DODGSON, CHARLES LUTWIDGE.

CARRON-OIL, a term for a liniment composed of linseed-oil and lime-water, so called from being much used in the case of burns at the Carron Ironworks.

CARSON, CHRISTOPHER, commonly called Kit, an American trapper and scout, born in Kentucky, Dec. 4, 1809. He served under General Fremont in his Rocky Mountain expeditions, and fought in the Mexican and Civil Wars, attaining to the rank of brevet Brigadier-General. In the course of his career as a trapper, hunter, Indian-fighter, scout and Indian agent, he met with many remarkable adventures. He died at Fort Lynn, Col., May 23, 1868.

CARSON, SIR EDWARD HENRY, a British statesman; born at Dublin, Ireland, Feb. 9, 1854. He was educated at Trinity College, Dublin, entered on the practice of law and was made Solicitor-General for Ireland in 1892. From 1900 to 1906 he was British Solicitor-General. He was the special champion of the Conservative Protestant communities of Ireland, chiefly centered in the province of Ulster, going so far as to organize troops and threaten armed resistance to the British Government if the provisions of the Home Rule Bill should be applied to Ulster. During the war, however, he was an ardent advocate of the Allied cause. He entered the Asquith Coalition Cabinet on May 26, 1915, as Attorney-General. He resigned in October of the same year, because of differences of opinion with his colleagues on the Dardanelles expedition. When the Lloyd George Cabinet was formed in 1917 Carson was made First Lord of the Admiralty. In the same year he became a member of the War Cabinet, without portfolio, but resigned suddenly in the early part of 1918, giving as his chief reason his desire to be entirely free in forming his judgment in regard to the Irish situation. In respect to the latter he continued an uncompromising opponent to Home Rule.

CARSON CITY, city, capital of the State of Nevada, and county-seat of Ormsby co.; on the Virginia and Truckee railroad, 32 miles S. E. of Reno. The city is located in a mining district and is the seat of a United States mint. It has several machine and railroad repair shops, State House, State Prison, an orphans' home, and an Indian school. It is only 10 miles from Lake Tahoe, and, on account of its beautiful scenery at the base of the Sierra Nevadas, is a popular summer resort. Pop. (1920) 1,685.

CARTAGENA (kär-tä-hä'nä), capital of the state of Bolívar, Republic of Colombia; on a sandy island off the N. coast, to the S. W. of the mouth of the Magdalena, and communicates by four bridges with its suburb, Jessemani, on the mainland. Though it has the best harbor on the coast, its trade has greatly fallen off since the rise of Sabanilla. The streets are narrow, with high houses, but the place is well built, and possesses a college, a handsome cathedral, and several churches. Founded in 1533, it was burned by Drake in 1585, but in 1741 repulsed an attack by Admiral Vernon. In 1815 the royalist General Morillo reduced the place by hunger, after a brave defense, but in 1821 it was again freed from the Spanish yoke. Pop., about 37,000.

CARTAGENA, or **CARTHAGENA**, a fortified town and seaport of Spain, in the province of and 31 miles S. S. E. of Murcia, with a harbor which is one of the largest and safest in the Mediterranean, sheltered by lofty hills. The town is surrounded by a wall; the principal streets are spacious and regular. When Spain was in a more flourishing condition Cartagena carried on a more extensive commerce than now, having also a greater population. It is still a naval and military station, with an arsenal, dockyards, etc. Lead smelting is largely carried on, and there are in the neighborhood rich mines of excellent iron. Esparto grass, lead, iron ore, oranges, etc., are exported. Formerly very unhealthy, it has been greatly improved by draining. Cartagena was founded by the Carthaginians under Hasdrubal about 288 B. C., and was called New Carthage. It was taken by Scipio Africanus, 210 B. C., and was long an important Roman town. It was ruined by the Goths, and revived in the time of Philip II. Pop. about 105,000.

CARTAGO, a town of Cauca, in Colombia, founded in 1540, on the Rio Viejo, three miles above its junction with the Cauca, and producing cocoa, tobacco, and coffee. Pop. about 10,000.

CARTAGO, a town of Costa Rica, 12 miles E. of the present capital, San José, on a plain to the S. of the constantly smoking volcano of Irazú (11,500 feet). Founded in 1522, the place had 23,000 inhabitants in 1823, and was capital of the state till 1841, when it was all but destroyed by an earthquake. Pop., about 5,000.

CARTE BLANCHE, a blank sheet of paper to be filled up with such conditions as the person to whom it is given may

think proper; hence an absolute freedom of action.

CARTEL, an agreement for the delivery of prisoners or deserters. Cartelship, a ship commissioned in time of war to exchange prisoners.

CARTER (LOUISE), **LESLIE**, an American actress, born in Lexington, Ky., in 1862. She made her first appearance on the stage in 1890 in "The Ugly Duckling." Under the tuition of David Belasco she acquired great dramatic skill and her appearance in 1895 in "The Heart of Maryland" made an immense sensation. This was followed in 1898 by "Zaza" and in 1901 by "Du Barry." In 1910 she appeared in a play entitled "Two Women." She has also played in some of the plays by George Bernard Shaw.

CARTERET, **SIR GEORGE** (kär-trä' or kar-ter-et'), one of the proprietors of New Jersey, born on the island of Jersey in 1599. He had a distinguished career in the British Navy, although he was expelled from the House of Commons on a charge of misappropriation of navy funds. He early manifested an interest in colonization and became, with Sir John Berkeley, one of the proprietors of New Jersey. He died Jan. 14, 1679.

CARTERET, **JOHN, EARL GRANVILLE**, British statesman, born April 22, 1690. He received his education at Westminster School and Christ Church College, Oxford. Entering the House of Lords in 1711, as second Baron Carteret, he espoused the side of the Whigs, and in 1714 made his first speech in the House of Lords in support of the Protestant Succession. In 1719 he was appointed by Stanhope ambassador extraordinary to Sweden, and succeeded in arranging two treaties of peace, the first between Sweden, Hanover, and Prussia, and the second between Denmark and Sweden. In 1721 he was appointed to one of the two foreign secretaryships, that for the "Southern Department" of Europe. In 1724 Carteret was appointed Lord-Lieutenant of Ireland, serving until 1726, and again from 1729 to 1730. Though he came into collision with Swift over the Drapier prosecution the two became warm friends before Carteret left Ireland. Between 1730 and 1742 Carteret took the lead in the House of Lords of the party opposed to Sir Robert Walpole. When this opposition succeeded in overthrowing Walpole, Carteret became the real head of the administration, but was driven from power by the Pelhams in 1744, about a month after he became Earl Granville on the death of

his mother. He died in London, Jan. 2, 1763.

CARTESIANISM, system of philosophy taught by Descartes.

CARTHAGE (*L. Carthago, Gr. Καρχηδόν*), the most famous city of Africa in antiquity, capital of a rich and powerful commercial republic, situated in the territory now belonging to Tunis. Carthage was the latest of the Phœnician colonies in this district, and is supposed to have been founded by settlers from Tyre and from the neighboring Utica about the middle of the 9th century before Christ. The story of Dido and the foundation of Carthage is mere legend or invention. The history of Carthage falls naturally into three epochs. The first, from the foundation to 410 B. C., comprises the rise and culmination of Carthaginian power; the second, from 410 to 265 B. C., is the period of the wars with the Sicilian Greeks; the third, from 265 to 146 B. C., the period of the wars with Rome, ending with the fall of Carthage.

The rise of Carthage may be attributed to the superiority of her site for commercial purposes, and the enterprise of her inhabitants. Her relations with the native populations, Libyans and nomads, were those of a superior with inferior races. Some of them were directly subject to Carthage, others contributed large sums as tribute, and Libyans formed the main body of infantry as nomads of cavalry in the Carthaginian army. Besides these there were native Carthaginian colonies, small centers and supports for her great commercial system, sprinkled along the whole northern coast of Africa, from Cyrenaica on the E. to the Straits of Gibraltar on the W.

In extending her commerce Carthage was naturally led to the conquest of the various islands which from their position might serve as entrepôts for traffic with the northern shores of the Mediterranean. Sardinia was the first conquest of the Carthaginians, and its capital, Caralis, now Cagliari, was founded by them. Soon after they occupied Corsica, the Balearic, and many smaller islands in the Mediterranean. When the Persians, under Xerxes, invaded Greece, the Carthaginians, who had already several settlements in the W. of Sicily, co-operated by organizing a great expedition of 300,000 men against the Greek cities in Sicily. But the defeat of the Carthaginians at Himera by the Greeks under Gelon of Syracuse effectually checked their further progress (480 B. C.). The war with the Greeks in Sicily was not renewed till 410. Hannibal, the son of

Gisco, invaded Sicily, reduced first Selinus and Himera, and then Agrigentum. Syracuse itself was only saved a little later by a pestilence which enfeebled the army of Himilco (396). The struggle between the Greeks and the Carthaginians continued at intervals with varying success, its most remarkable events being the military successes of the Corinthian Timoleon (345-340) at Syracuse, and the invasion of the Carthaginian territory in Africa by Agathocles, 310 B. C.

After the death of Agathocles the Greeks called in Pyrrhus, King of Epirus, to their aid, but notwithstanding numerous defeats (277-275 B. C.), the Carthaginians seemed, after the departure of Pyrrhus, to have the conquest of all Sicily at length within their power. The intervention of the Romans was now invoked, and with their invasion, 264 B. C., the third period of Carthaginian history begins. The first Punic war (*L. Punicus, Phœnician*), in which Rome and Carthage contended for the dominion of Sicily, was prolonged for 23 years, 264 to 241 B. C., and ended, through the exhaustion of the resources of Carthage, in her expulsion from the island. The loss of Sicily led to the acquisition of Spain for Carthage, which was almost solely the work of Hamilcar and Hasdrubal. The second Punic war, arising out of incidents connected with the Carthaginian conquests in Spain, and conducted on the side of the Carthaginians by the genius of Hannibal, and distinguished by his great march on Rome and the victories of Lake Trasimene, Trebia, and Cannæ, lasted 17 years, 218 to 201 B. C., and after just missing the overthrow of Rome, ended in the complete humiliation of Carthage. The policy of Rome in encouraging the African enemies of Carthage occasioned the third Punic war, in which Rome was the aggressor. This war, begun 150 B. C., ended 146 B. C., in the total destruction of Carthage.

The constitution of Carthage, like her history, remains in many points obscure. The name of king occurs in the Greek accounts of it, but the monarchial constitution, as commonly understood, never appears to have existed in Carthage. The officers called kings by the Greeks were two in number, the heads of an oligarchical republic, and were otherwise called Suffetes, the original name being considered identical with the Hebrew *Shofetim*, judges. These officers were chosen from the principal families, and were elected annually. There was a senate of 300, and a smaller body of 30 chosen from the senate, sometimes another smaller council of 10. In its later ages the state was divided by

bitter factions, and liable to violent popular tumults. After the destruction of Carthage her territory became the Roman province of Africa. Twenty-four years after her fall an unsuccessful attempt was made to rebuild Carthage by Caius Gracchus. This was finally accomplished by Augustus, and Roman Carthage became one of the most important cities of the empire. It was taken and destroyed by the Arabs in 638. The religion of the Carthaginians was that of their Phoenician ancestors. They worshipped Moloch or Baal, to whom they offered human sacrifices; Melkart, the patron deity of Tyre; Astarte, the Phoenician Venus, and other deities, which were mostly propitiated by cruel or lascivious rites.

CARTHAGE, city and county-seat of Jasper co., Mo., on the St. Louis and San Francisco, and the Missouri Pacific railroads, 300 miles S. W. of St. Louis. It is the center of an extensive lead region, and has zinc mines, stone and lime works, flour mills, machine shops and foundries, churches, public library, parks, electric railways and light, National banks, several daily and weekly newspapers, public schools, etc. Carthage was the scene of a battle, fought July 5, 1861, between a Federal army under General Sigel, and Confederates under Generals Parsons and Rains, in which the former was defeated. Pop. (1910) 9,483; (1920) 10,068.

CARTHAGE, CAPE, a headland of north Africa, jutting out into the Mediterranean, in $36^{\circ} 52'$ N. lat., $10^{\circ} 22'$ E. lon., with traces of the ancient city of Carthage to the N. of the Tunis lagoon.

CARTIER, JACQUES, a French navigator, born in St. Malo, Dec. 31, 1494. He commanded an expedition to North America in 1534, entered the Straits of Belle Isle, and took possession of the mainland of Canada in the name of Francis I. Next year he sailed up the St. Lawrence as far as the present Montreal. He subsequently went to found a settlement in Canada, and built a fort near the site of Quebec. He died about 1554.

CARTWRIGHT, JOHN, the "Father of Reform," was born in Marnham, England, Sept. 17, 1740. At 18 he entered the navy, saw some service under Howe, and in 1766 was gazetted first-lieutenant of the "Guernsey" at the Newfoundland station. He returned in 1770, and was appointed in 1775 major to the Notts militia. He then began to think and write on political questions, and found himself unable to take service under Lord Howe in North America. From the beginning

he advocated annual parliaments, vote by ballot, and manhood suffrage, and throughout his busy life he advocated with equal ardor causes so different as reform in farming, abolition of slavery, the foundation of a Valhalla for English seamen, the improvement of national defenses, and the liberties of Spain and Greece. Cartwright was fined £100 for sedition in 1820. He died in London, Sept. 23, 1824.

CARUS, PAUL, an American journalist and philosophical writer; born at Ilsenburg, Germany, July 18, 1852. He was educated at Strassburg and Tübingen, but most of his life work was done in Chicago. There he was editor of the "Open Court" and the "Monist." He was a prolific and able writer on philosophical and religious themes, from the standpoint of a pronounced freethinker. His publications include "The Soul of Man" (1891), "Monism and Meliorism" (1891), "The Religion of Science" (1893), "God: An Inquiry into Man's Highest Ideals" (1908), "The Mechanistic Theory and the Non-Mechanical" (1913), "Nietzsche and Other Exponents of Individualism" (1914). He died at La Salle, Ill., Feb. 11, 1919.



ENRICO CARUSO

CARUSO, ENRICO, an Italian operatic tenor; born at Naples, Feb. 25, 1873. As a child, his voice attracted attention, and when only 11 years old he was singing in a church at Naples. He

was taken in hand by singing masters of note, and for three years was a pupil of Vergine, Concone, and Lamperti. His débüt as an opera singer was made at the Nuovo Teatro, Naples, in 1894, in "L'Amico Francesco." He made a tour of Italy and was engaged for four seasons at La Scala, Milan. It was not until 1896, however, that he had a great triumph in "Traviata" at the Teatro del Fondo, Naples, and the opera world realized that a new star had arisen. Offers of engagements were showered upon him, and he sang in the chief capitals of Europe and South America. He came to the United States in 1903 and was hailed as the greatest tenor of the age. Since that time he sang every season in New York. The power, range, and beauty of his voice put him practically beyond comparison with any living tenor. He had a repertoire of over forty operas. He created rôles in Giordano's "Fedora," Mascagni's "Le Maschere," Puccini's "Bohème," "Madame Butterfly," and "The Girl of the Golden West." Between the New York seasons, Caruso often filled engagements in Europe and America. He died on Aug. 2, 1921.

CARVER, JOHN, a "Pilgrim Father," the first governor of the Plymouth colony, born in England, about 1575. He joined the Leyden colony of English exiles about 1608, and as their agent assisted in securing a charter from the Virginia Company and in selecting and equipping the "Mayflower." He was elected governor probably Nov. 11, 1620, after the "Mayflower" reached Provincetown, showed great ability and judgment in governing the infant colony after the landing at Plymouth, and established by a treaty with the Indians peaceful relations that remained for many years undisturbed. He was re-elected in March, 1621, but died a few days afterward. His chair and sword are still preserved as Pilgrim reliques.

CARY, ALICE, an American poetess, born near Cincinnati, O., April 26, 1820. When quite young she began writing sketches and poems for the press. In 1852 he, with her sister PHOEBE (q. v.) removed to New York City, where they lived during the rest of their lives. In 1850 the sisters published a volume entitled "Poems by Alice and Phœbe Cary." Alice soon after published "Clovernook, or Recollections of Our Neighborhood in the West" (1851-1853), "Hagar, a Story of To-day" (1852), "Married, Not Mated" (1856), "The Lover's Diary" (1867), and "Snow Berries: A Book for Young Folks" (1869). She died in New York City, Feb. 12, 1871.

CARY, ANNIE LOUISE, an American singer; born in Wayne, Me., Oct. 22, 1842; studied in Milan, made her operatic débüt in Copenhagen in 1868, had a successful European career for three years, and returned in 1870 to the United States, where she won great popularity and remained, with the exception of one brilliant European tour, until 1882, when she married Charles M. Raymond, and retired from the stage while her voice was still unimpaired. Since then she has appeared only in private or for charity.

CARY, PHŒBE, an American poetess and prose-writer, sister of Alice; born in Cincinnati, O., Sept. 4, 1824; contributed numerous sketches to various periodicals; and like her sister published many books, among which are "Poems and Parodies" (1854), and "Poems of Faith, Hope, and Love" (1868). She died in Newport, R. I., July 31, 1871.

CASALS, PABLO, a Spanish musician, born at Vaudrell, Spain, in 1876. He studied music under his father and other teachers and became professor of the 'cello at Barcelona University. He first appeared as a soloist in Paris in 1898. In 1901 he made his first visit to the United States. This was followed by frequent tours. He was recognized as a master of the 'cello and he composed many works for the 'cello and organ.

CASAMICCIOLA (käs-ä-mēch-yō'lā), a favorite watering-place on the island of Ischia. The season extends from June to September. By the earthquake of July 28, 1883, the place was almost entirely destroyed. Pop. about 3,000.

CASCADE RANGE, a chain of mountains in the States of Oregon and Washington. It takes its name from the cascades formed by the Columbia river breaking through the mountains. It is a continuation of the Sierra Nevada of California, and is nearly parallel with the Pacific coast. Some of the highest peaks are Mt. Hood, 11,225 feet, Mt. Jefferson in Oregon, and Mt. Tacoma in Washington, 14,444 feet high.

CASCO BAY, a bay on the S. W. coast of Maine; is about 20 miles wide and so deep as to constitute one of the best harbors of the world, for all kinds of vessels. It contains many islands.

CASEIN, or **CASEINE**, an albuminoid substance found in milk, soluble in alkali. It is coagulated by animal membranes. It dries into a yellow mass, and contains less nitrogen than albumin. A similar substance, called vegetable casein, or legumin, occurs in peas, beans, etc. Vegetable casein is a substance essentially the same as animal casein, of

which from 20 to 27 per cent. occurs in the pea and bean, while the seeds of leguminous plants in general contain a considerable proportion of it.

CASEMENT, SIR ROGER (DAVID), an Irish revolutionist; born in Ireland, Sept. 1, 1864. He was of English parentage and a Protestant, though, just before his death, he was received into the Roman Catholic Church. In the early part of his career he was an able and faithful official of the British Government, serving in various capacities in many parts of the world. From 1892 to 1895 he was in a minor post in the Niger Coast Oil Rivers Protectorate, and in the latter year was appointed consul in the province of Lourenzo Marquez. During the Boer War he did such excellent service at Cape Town that he was decorated with the Queen's medal. In 1906 he was consul for the state of São Paulo, Brazil. He became consul-general at Rio de Janeiro in 1908. From 1909 to 1912 he made a searching investigation into the rubber atrocities, and his report attracted attention throughout the world. The honor of knighthood was conferred upon him in 1911, and in 1913 he was retired on a pension. It seemed the climax of a peculiarly useful career. However, after the outbreak of the World War, rumors began to filter through to England that Casement was in Germany going from place to place without guard or surveillance and apparently in the full favor of the German Government. The full story of Casement's activities in Germany came out later, supported by documentary evidence that left no doubt of the facts. In the early days of the war a large number of British soldiers, including a great many Irishmen, had been captured by the enemy and imprisoned in camps in various parts of Germany. Casement was permitted by the German Government to move freely among these camps and to address the prisoners. He invited the Irish prisoners to join the "Irish brigade" that he was forming. Those who joined would escape the rigors of imprisonment, would be regarded as guests of the German Government and would be transferred to Berlin, there to wait a favorable opportunity to be transferred to Ireland. In the event that this proved impossible, each man would be furnished with a sum of money and free passage to America after the war, and thus escape the vengeance of the British Government. Casement made slight progress in this propaganda. Pending the transfer of the "Irish brigade," Casement, with a few confederates, made a rash attempt to land muni-

tions on Irish soil. In April, 1916, Casement and two confederates embarked on a German submarine at Wilhelmshaven, which sailed around the Shetlands and the west coast of Ireland. Near Tralee, when the submarine had reached as near the coast as she dared to go, the adventurers were put into a collapsible boat, which overturned, however, before they reached the land, compelling them to wade to shore. They buried their revolvers and ammunition in the sand, and two of the voyagers made their way to Tralee, while Casement sought a hiding place near by and waited for the coming of the ship loaded with munitions that the German Government had promised to send. On April 21 the British ship "Bluebell," patrolling the coast, sighted a ship which looked suspicious. It was a small Wilson liner, disguised as a timber ship and flying the Norwegian ensign. She declared, on being signaled, that she was the "Aude," sailing to Genoa from Bergen. Not satisfied, however, the British commander ordered the strange ship to follow him into the harbor to be examined. Seeing that the game was lost, the ship suddenly raised two German ensigns and blew up, the crew rowing to the "Bluebell" and giving themselves up. It developed later that the ship had been carrying millions of cartridges, 20,000 rifles, 10 machine guns and a large number of bombs and other munitions. In the meantime an Irish farmer had found the collapsible boat. He reported his discovery, and a search was made by the authorities, who unearthed the box that had been buried in the sand containing pistol cartridges. Further search revealed Casement hiding in a place that was known as McKenna's Fort. He described himself as an author, Richard Morton by name, and claimed residence in Buckinghamshire, England. He was arrested, nevertheless, and while on his way to a neighboring barracks to be examined, dropped a paper which was picked up by his captors and discovered to be a code in cipher. Sentences about "explosives" and "cannon" deepened the impression of his guilt. He was taken to London and handed over to the authorities, to whom he then confessed his identity. He was tried before a jury, and on June 26, 1916, was found guilty of high treason and sentenced to death. During his trial Casement bore himself with great dignity and fortitude. Efforts were made by many prominent persons in Great Britain and the United States to have the sentence commuted or modified, some on the ground of his previous services to the Empire and others on the possi-

bility that his mind was unbalanced. Their pleas, however, were ineffectual, and Casement was hung at Pentonville prison, Aug. 3, 1916.

CASERTA, a town of Italy; capital of the province of the same name; on a plain 20 miles N. N. E. of Naples by rail. It is chiefly remarkable on account of its magnificent palace, one of the finest in Europe, which was founded by Charles III. in 1752. Pop. about 32,000.

CASERTA, or **TERRA DI LAVORO**, a province of Italy, N. of Naples, along the Mediterranean Sea. Its chief industries are agriculture and cattle raising; there are also some flourishing manufactures. Area, 2,033 square miles. Pop. about 820,000.

CASE SCHOOL OF APPLIED SCIENCE, an institution for technical education, founded in 1890 in Cleveland, O. There are departments of engineering, astronomy, and other scientific subjects. In 1919 there were 572 students and 52 instructors. President, C. S. Howe.

CASHEL, a town in Tipperary county, Ireland, about 49 miles N. E. of Cork; noted as containing the most interesting ruins in Ireland. These consist of a cathedral, founded in 1169; a stone-roofed chapel, built in 1127; Hore Abbey, founded in 1260; the palace of the Munster Kings; and a round tower, 90 feet in height and 56 feet in circumference. They are built on the summit of the slope which the town occupies, and called collectively "Rock of Cashel." Here was held the great synod, in 1172, when the Irish priests first acknowledged the authority of the English Church and State. Cashel is a Roman Catholic Archdiocese. Pop., about 3,000.

CASHMERE. See **KASHMIR**.

CASIMIR, properly **KAZIMIERZ** ("founder of peace"), was the name of many Polish princes and kings. With the establishment of the power of Casimir I. in 1041, the predominance of Christianity was decided in Poland. But the most distinguished of this name was Casimir III., called Casimir the Great, who succeeded his father, Vladislav Loketek, as King of Poland in 1333. He added Little Russia and Red Russia to his dominions and repelled the Tartars, who then threatened Poland. He founded the University of Cracow (1364), as well as several schools and hospitals, and showed great anxiety for the advancement of the arts and of learning in his kingdom, and for the improvement of the condition of the most oppressed classes, which won him the title of King

of Peasants, while a Jewish mistress obtained from him special liberties for her race. He died Nov. 5, 1370.

CASIMIR-PÉRIER, JEAN PAUL PIERRE (kás-é-mér' per-yá'), a President of the French Republic, born in Paris, Nov. 8, 1847. He served in the Franco-Prussian War, and received the decoration of the Legion of Honor for bravery. In 1876, he was elected to the Chamber of Deputies; in 1890, Vice-President of the Chamber; and in 1893, President. He resigned to become Premier, which office he held till the assassination of President Carnot, when he was chosen his successor on the first ballot (June, 1894). He resigned the office of President, Jan. 16, 1895. He died March 12, 1907.

CASPER, a town of Wyoming, the county-seat of Natrona co. It is on the Chicago and Northwestern, and the Chicago, Burlington, and Quincy railroads, and on the Platte river. The town has an important trade in wool, live-stock, and oil. It is the seat of the Wyoming General Hospital, and has a library and other public buildings. Its chief industry is a large petroleum by-product plant. Pop. (1910) 2,639; (1920) 11,447.

CASPIAN SEA (*ancient Mare Hyrcanum*), a great salt lake on the boundary of Europe and Asia, wholly inclosed, having no outlet whatever to the ocean, and surrounded by Persia, the Azerbaijan republic, the Caucasian countries, the Russian governments of Orenburg and Astrakhan, and the Siberian provinces of Uralsk and Transcaspia. Its greatest length from N. to S. is 760 miles; average breadth, 200; area, about 150,000 square miles. The waters of this inland sea are less salty than those of the ocean. The water has a bitter taste, ascribed by some to the great quantities of naphtha with which the surrounding soil abounds, but by others to the presence of Glauber salts, among the substances held in solution. The fish are principally salmon, sturgeons, and sterlets; a kind of herring is also found, and there are porpoises and seals. One of the most important industries of its shore towns is the manufacture and export of caviar. The Caspian Sea has no tides, but its navigation is dangerous because of violent storms, especially from the S. E., by which its waters are sometimes driven for many miles over the adjacent plains. The depth near the S. end is about 600 feet; and in some places near the center it attains a depth of nearly 3,000 feet; but near the coast it is very shallow, seldom reaching a depth

of more than 3 feet at 100 yards from the shore, and in many places a depth of 12 feet is not reached within several miles of the beach. On the N. E. and E. it is especially shallow. The water level of the Caspian Sea is about 85 feet below that of the Black Sea. It receives the waters of a number of large rivers, of which the greatest is the Volga. The Ural, the Terek, and the Kur also fall into it. The most important towns on its shores are Baku in the Azerbaijan republic, Astrakhan, Petrovsk, and Krasnovodsk in Russia, and Enzeli and Resht in Persia. Communication with the Baltic Sea is possible by way of the Volga and various canals. Baku is the eastern terminal of two railways, and Krasnovodsk the western terminal of the Transcaspian railway.

CASS, LEWIS, an American statesman, diplomatist, and soldier, born in Exeter, N. H., Oct. 9, 1782; served in the War of 1812; was governor of Michigan Territory (1813-1831); Secretary of War (1831-1836); minister to France (1836-1842); United States Senator (1845-1848); Presidential candidate (1848); United States Senator (1849-1857); Secretary of State (1857-1860). He wrote: "History, Traditions, and Languages of the Indians" (1823); "France, Its King, Court, and Government"; etc. He died in Detroit, Mich., June 17, 1866.

CASSANDRA, according to Homeric legend, was daughter of Priam and Hecuba. She was passionately loved by Apollo, who promised to grant her whatever she might require, if she would look with favor on his suit. She demanded the power of prophecy, and as soon as she had received it, refused to perform her promise, and slighted Apollo. The god, thus disappointed, wetted her lips with his tongue, and thus no belief was ever placed in her predictions. She endeavored to prevent the entrance into Troy of the wooden horse of the Greeks, but was unsuccessful.

CASSATT, ALEXANDER JOHNSTON, an American railway executive; born at Pittsburgh, Pa., Dec. 8, 1839. He received his education at the University of Heidelberg and the Rensselaer Polytechnic Institute, Troy, N. Y. He entered the service of the Pennsylvania railroad in 1861 in the capacity of a surveyor and worked his way up through the various branches of the service until in June, 1899, he became president of the system. He was a successful executive, and had many interests in banks, trust companies, and large corporations. It was chiefly due to his vision and en-

terprise that the Pennsylvania terminal in New York, with its tunnels under the Hudson and East rivers, was planned and built. He died at Philadelphia, Dec. 28, 1906.

CASSATT, MARY, an American figure and portrait painter, born in Pittsburgh, Pa.; studied art in Philadelphia and in Europe; and lived some time in Spain and France. One of the first to adopt impressionistic methods, she exhibited some excellent work in the Paris Exposition of 1878; became a member of the Society of American Artists in 1880. As an etcher she ranks among the best. She painted almost exclusively women and children. Specimens of her art are in many American and European private and public collections. Her studio is at Paris.

CASSEL, or **KASSEL**, formerly the residence of the Elector of Hesse-Cassel, is now the chief town in the province of Hessen-Nassau, Prussia, on the Fulda, 91 miles N. N. E. of Frankfort-on-the-Main. The Old and New Town are connected by a bridge over the Fulda. There are several fine squares, in the principal of which, the Friedrichsplatz, the largest in any town in Germany, stands the palace of the ex-elector, an indifferent structure. There is a museum and library (250,000 vols.), and a valuable picture-gallery. The city has manufactories of machinery, mathematical instruments, gold and silver wares, chemicals, knives, gloves, leather, porcelain, etc. There are many fine walks and public gardens in the vicinity; among the latter are the gardens of Wilhelmshöhe, in which is situated the ex-elector's summer palace, the residence of Napoleon III., while he was a prisoner of war, from Sept. 5, 1870, to March 19, 1871. Pop. about 170,000.

CASSIOPEIA, or **CASSIEPEIA**, (1) the wife of Cepheus, King of *Aethiopia*, and mother of Andromeda. (2) "The Lady in her Chair," one of the northern circumpolar constellations included in Ptolemy's original 48. The figure is that of a woman seated in a chair and turning backward round the pole of the heavens. The constellation is bounded by Cepheus, Camelopardalis, Perseus, Andromeda, and Lacerta. It is in this constellation that the *Nova* (Lat. "new") of 1572, or Tycho Brahe's wonderful star, burst forth in November of that year.

CASSIUS, full name, **CAIUS CASSIUS LONGINUS**, one of the assassins of Julius Cæsar. In the civil war that broke out between Pompey and Cæsar he espoused the cause of the former, and,

as commander of his naval forces, rendered him important services. After the battle of Pharsalia he was apparently reconciled with Cæsar, but later was among the more active of the conspirators who assassinated him, 44 B. C. He then, together with Brutus, raised an army, but they were met by Octavianus and Antony at Philippi. The wing which Cassius commanded being defeated, he imagined that all was lost, and killed himself, 42 B. C.

CASSOWARY, a bird, the *Casuarius galeatus*. That called in Banda, Eme or Eume, and hence by the Portuguese Emu. It is nearly as large as an ostrich, being about five feet high. It has on its head a crest helmet, or casque, and pendent caruncles like those of the turkey. In-



CASSOWARY

stead of having feathers on its wings like the ostrich, it has stumps somewhat resembling pendent hair, and while the ostrich has two toes on the feet, this has three, with a large claw on the inner toe. It is a native of the Indian Archipelago, where it feeds on fruits, seeds, and leaves, deposits its eggs in the sand, and runs with great rapidity when pursued.

CASTAIGNE, ANDRÉ, a French artist; born at Angoulême, in 1861. He studied at the Ecole des Beaux-Arts in Paris. From 1890 to 1895 he resided in the United States, was director of an art school in Baltimore and did a great deal of illustrating for the magazines, attracting attention by the spirit and vividness of his work. In 1904 he published "Fata Morgana," a novel illustrated by himself.

CASTALIDES, a name given to the Muses.

CASTELLAMARE, (käs-tel-ä-mär'e), a fortified Italian seaport in the prov-

ince of Naples; on the site of the ancient Stabiae where Pliny was killed. It has a dockyard and hospital, and manufactures sail-cloth, leather, linen, and silk. Its castle was built in the 13th century by Emperor Frederick II. It contains a convent founded by Gonsalvo de Cordova, which possesses a very celebrated image of the Madonna. In the 15th century the town was sacked by Pope Pius II., and in the 17th century by the Duke of Guise. Pop. about 35,000.

CASTELNAU, ÉDOUARD DE CURIÈRES DE, a French military officer born at St. Afrique in 1851. He was studying at the military school at St. Cyr, which he had entered in 1869, when the Franco-Prussian War broke out. He immediately applied for a commission and served through the war, rising to the rank of captain. Later he rose through the various grades of the service, became general in 1906, and when General Joffre was designated as commander-in-chief in case of war (1913), Castelnau became his chief-of-staff. At the outbreak of the war, he commanded the Army of Lorraine, and was charged with the defense of Nancy. From Sept. 6 to 12, 1914, a tremendous battle raged for the possession of the city, which was regarded as the "Gate to Paris," and the Bavarian army under Crown Prince Rupprecht was defeated. Castelnau was hailed as the "Savior of Nancy." In 1915 he was in charge of the French offensive in the Champagne, and in 1918 when the armistice was signed he was preparing, jointly with General Pershing, for a great attack upon Metz.

CASTILE (kas-tēl'), an ancient kingdom of Spain, the nucleus of the Spanish monarchy, extends over a large part of the peninsula from the Bay of Biscay southward. It is divided into New Castile and Old Castile. The former (*Castilla la Nueva*) occupies nearly the center of the peninsula; area, 28,010 square miles. It is traversed from E. to W. by three lofty mountain chains nearly parallel to each other—the Sierra Guadarrama, the mountains of Toledo, and Sierra Molina, and the Sierra Morena. Between these chains, which form the great watersheds of the province, lie two extensive plains or plateaux, almost without wood, and arid and barren in appearance. Dryness, indeed, is the curse of the whole country, and there is a great deficiency of method alike in agriculture and industries. The inhabitants are of a grave, manly character, with much of the old Spanish pride and probity, but devoid of enterprise, and content to live on from day to day as

their fathers did before them. This ancient province now forms the five provinces of Madrid, Ciudad-Real, Cuenca, Guadalajara, and Toledo. Pop. about 2,400,000.

Old Castile (*Castilla la Vieja*) stretches from the Bay of Biscay to New Castile; area, 25,405 square miles. It is traversed by three mountain chains—the Sierra de Guadarrama, the Sierra de Deza, and the Cantabrian Mountains. It is less dry than New Castile, and grain, particularly wheat, is raised in great abundance. The pastures both of the mountains and the plains are excellent, and much merino wool is produced. Old Castile now forms the provinces of Burgos, Logroño, Santander, Soria, Segovia, Avila, Palencia, and Valladolid. Pop. about 1,900,000.

CASTILLON (käs-tē-yōn'), a town in the French department of Gironde, on the right bank of the Dordogne, 33 miles E. of Bordeaux by rail. Beneath its walls, on June 13, 1453, the English met with a signal defeat, their leader, Earl Talbot of Shrewsbury, and his son, being slain. Part of the battle is described in the fourth act of Shakespeare's "King Henry VI., Part I." Pop. about 3,500.

CASTLE, a building constructed for the purpose of repelling attack. The *castella* left by the Romans in Great Britain and elsewhere were constructed on the general model of their stationary encampments (*castra stativa*), and though they may have suggested the castles of the Middle Ages, they differed from them in being designed for military purposes only, and not also as places of permanent residence. The Norman castles were generally surrounded by a moat or ditch; and in order that the ditch might be readily filled with water the site chosen was usually either on the banks of a river or on a peninsula running into a lake; on the inner side of the ditch mounds were constructed, which were surmounted with walls and towers, both of which, but particularly the latter, were supplied with battlements and bastions. The entrance-gates were also protected by towers, which were usually of great strength. The communication was by a bridge, sometimes of stone, but usually of wood, which was made to draw up and down; and the entrance, in addition to thick folding-doors, was protected by a portcullis, which was dropped down through grooves in the masonry at the sides. The gate-way, in the castles of the larger sort, was further defended by a barbican. On passing the external wall one entered the bailey, which sometimes con-

sisted of several courts, and contained the barracks, magazines, well, a chapel, and sometimes even a monastery. The keep was a species of internal castle, more strongly defended than any other portion of the fortress, and placed in the most advantageous position, so as to afford a last chance to the garrison when driven from the external works. As the keep had the same design as the castle itself, it contained most of its appliances, even to a chapel, when large and complete. The keep was also called the dungeon or donjon.

CASTLE, EGERTON, an English author, born March 12, 1858. He was educated at Glasgow University and Cambridge. After a brief military career he turned to literature and journalism. His novels, some of which have been dramatized and many of which were written in collaboration with his wife, Agnes Castle, include: "Consequences," "Saviola," "The Light of Scarthey," "The Pride of Jennico," "Young April," "The Star-Dreamer," "Wroth," "The Grip of Life," etc. He died in 1920.

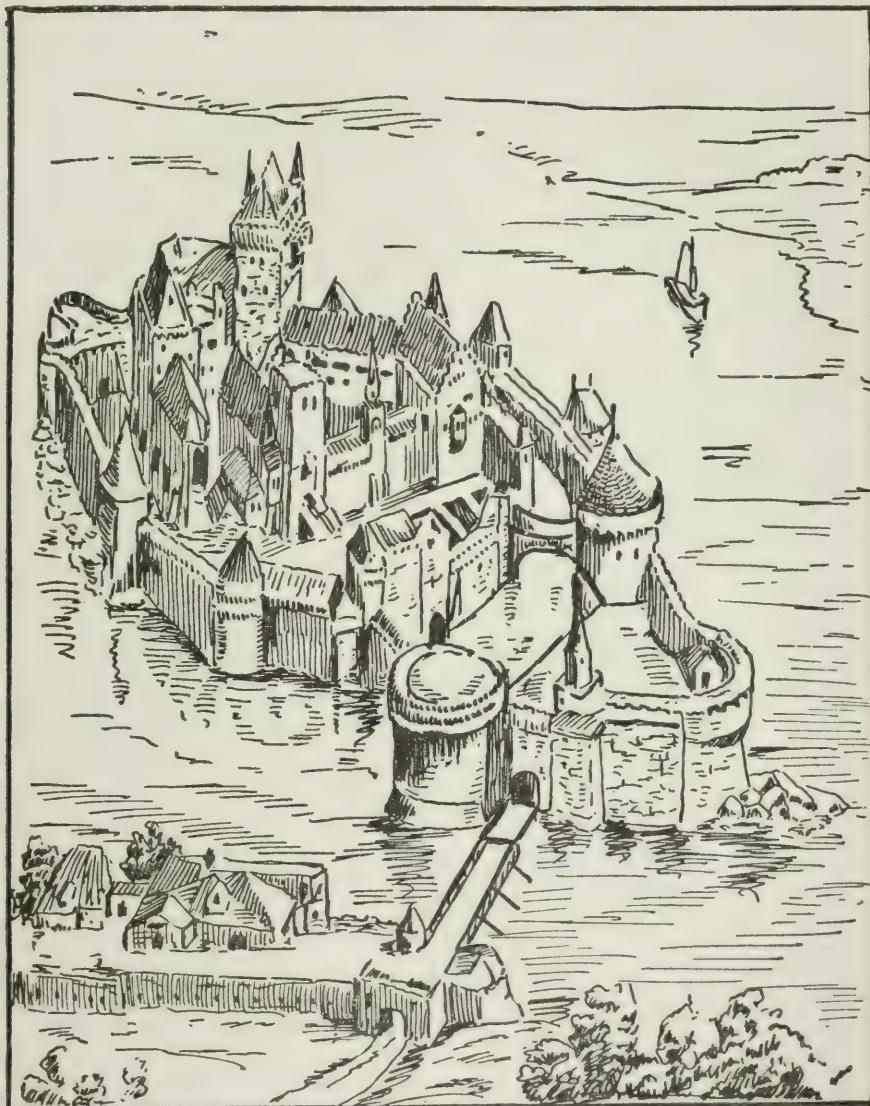
CASTLE, VERNON, an English actor and aviator; born at Norwich, England, May 2, 1887. His last name was Blythe, but he dropped it for professional purposes, retaining his first two names. He was educated at Birmingham University and expected to become a civil engineer. He turned, however, to the stage, coming to America and making his début in 1907. He soon discovered that his real talent lay in dancing and inventing new steps. With his wife, formerly Miss Irene Foote, whom he married in 1911, he speedily became the vogue as an exhibition dancer and teacher. Shortly after the opening of the World War, he studied aviation, received a pilot's certificate from the Aero Club of America, and in March, 1917, attached himself to the British Royal Flying Corps on the western front. He did good service there for a year. He then came to America to act as instructor to the Canadian units of the flying corps, who were having winter training in Texas, and was killed in an airplane accident, Feb. 5, 1918.

CASTLEBAR, the capital town of County Mayo, Ireland. It is on the Castlebar river, 10 miles N. E. of Westport; has linen manufactures. In 1641 occurred here the massacre of the English Parliamentary army in the Irish rebellion; in 1789 Castlebar was held for a fortnight by the French general, Humbert. Pop. about 4,000.

CASTLEREAGH, ROBERT STEWART, VISCOUNT (kas-el-rā'), second

Marquis of Londonderry, an English statesman, born June 18, 1769; was educated at Armagh, and at St. John's College, Cambridge. He turned Tory in 1795, and next year became Keeper of

tary from 1797, he bent his whole energies to forwarding Pitt's measure of union. Transferred by the union from Dublin to Westminster, he accepted office in the Addington ministry (1802)



MEDIAEVAL CASTLE

the Privy Seal; but he continued a steadfast supporter of Catholic emancipation. Still, he believed that emancipation with an independent Irish Parliament would mean simply a transference of tyranny from the Protestant oligarchy to a Catholic democracy; hence, as Chief Secre-

as President of the Board of Control; but the true second era in his career was as War Minister under Pitt from July, 1805, to January, 1806, and again under Portland from April, 1807, to September, 1809. His real greatness begins with March, 1812, when, as Foreign Secretary

under Lord Liverpool, he became the soul of the coalition against Napoleon, which, during the momentous campaigns of 1813-1814, was kept together by him, and by him alone. He represented England at the congresses of Chatillon and Vienna in 1814-1815, at the Treaty of Paris in 1815, at the Congress of Aix-la-Chapelle in 1818; and he was preparing to start for a congress at Verona, when, on Aug. 12, 1822, in a fit of insanity, he committed suicide with a penknife at Fooths Cray, his Kentish seat.

CASTLETOWN (*Manx Balley Cashtal*), a seaport and former capital of the Isle of Man, on Castletown Bay, 11 miles S. W. of Douglas. Castle Rushen, now a prison, occupies the site of a Danish fortress of the 10th century, which was almost wholly demolished by Robert Bruce in 1313. The grounds of Rushen Abbey (11th century), near the station, are now market gardens. Near by is the small building where the House of Keys assembled for about 170 years. Brewing, tanning, and lime-burning are carried on. Near Castletown is King William's College (1833), an Elizabethan pile, rebuilt after the fire of 1844, and enlarged in 1862. Pop. about 2,000.

CASTOR AND POLLUX, two demi-gods known by the ancients under the joint name of Dioscuri, that is, sons of Zeus or Jupiter. Castor was celebrated as a horse tamer; Pollux for his prowess as a boxer. Homer describes them as sons of Leda and Tyndareus, King of Lacedemon, and, therefore, brothers of Helen. Hence, too, their patronymic of Tyndaridæ (sons of Tyndareus). Another fable ascribes their birth to an amour of Jupiter with Leda; while a third account makes Pollux and Helen only the fruit of this intercourse, and Castor the lawful son of Tyndareus, whence it was supposed that the latter was mortal, and Pollux immortal. The brothers are described as having first distinguished themselves by the rescue of their sister Helen, who had been carried off by Theseus. They were engaged in the celebrated hunt of the Calydonian boar; were sharers in the renowned expedition of the Argonauts; and, finally, in a war against Messene, undertaken for the purpose of chastising Idas and Lynceus, sons of the king of that country. Castor was slain by Idas, who was immediately struck dead by a thunderbolt from Jove, and Lynceus fell by the hand of Pollux. The latter, devotedly attached to his brother, besought Jupiter either to restore Castor to life or to deprive him himself of his immortality. On this, according to one story, Jupiter granted them alternate life, so that each

lived or died daily—a term extended by some writers to six months of alternate life and death of each. Another version makes Jupiter reward their affection by translating the two brothers into constellations, under the name of Gemini—stars which never appear together, but when one rises the other sets, and so on alternately. These demi-gods were chiefly worshipped as protectors of seamen, though they were supposed to be helpers of the brave generally. They are usually represented on medals, bas-reliefs, and gems, as youthful horsemen, with egg-shaped helmets crowned with stars, and spear in hand. The ancients very commonly swore "by Castor" (*Æcastor*) and "by Pollux" (*Ædepol*), as the English did by St. George, and the French by St. Denis.

CASTOR OIL, a fixed oil obtained from the seeds of the castor oil plant. In extracting the oil the seeds are first bruised between heavy rollers and then pressed in hempen bags under a hydraulic or screw press. The best variety of oil is thus obtained by pressure in the cold, and is known as cold-drawn castor oil, but if the bruised and pressed seeds be afterward steamed or heated and again pressed, a second quality of oil is obtained, which is apt to become partially solid or frozen in cold weather. In either case the crude oil is heated with water to 212°, which coagulates, and separates the albumen and other impurities. Exposure to the sun's light bleaches the oil, and this process is resorted to on a large scale. When pure and cold-drawn, castor oil is of a light-yellowish color; but when of inferior quality it has a greenish and occasionally a brownish tinge. It is somewhat thick and viscid. Its sp. gr. is high for an oil, being about 960 (water being taken as 1,000). It is mixable with alcohol, or spirits of wine, and ether. It has a nauseous smell and an acrid, disagreeable taste, which may be overcome by the addition of a little magnesia. The principal acid in it is ricinoleic acid. Castor oil is one of the most convenient and mildest of purgative medicines. The sickness often produced by the disagreeable flavor of castor oil is by some obviated by floating the oil in hot coffee, which in a measure removes its nauseous qualities.

CASTRO, CIPRIANO, ex-president of Venezuela. He was born in 1860 in the province of Tachira, and was a member of the Venezuelan Senate at the fall of President Palacio (1892), when he left the capital. Leading a successful uprising against Andrade in 1899, he occupied Caracas, and the next year was elected

provisional president, in 1901 being chosen president for six years. But he rapidly developed into a tyrannical, vain-glorious, corrupt and disastrous ruler, of the most arbitrary and shameless character, so that the affairs of Venezuela became disastrously entangled, its commerce paralyzed, and its relations with other nations seriously compromised. He "revised" the constitution, enabling himself to be re-elected at the end of his term, and so mistreated foreigners in business in Venezuela and the creditor nations that had made loans to the country that Great Britain, Germany, and Italy at length threatened and began violent measures. He asked the United States to aid him in settlements, but when agreements had been made to submit all to the Hague Tribunal and (1904) it had decided in favor of preferential treatment for the creditor nations, he evaded all settlements, and in matters between Venezuela and the United States he refused either settlement or arbitration. During the complications, however (he being supposed to have secreted abroad large sums to his individual credit), he went suddenly to Europe in 1908, as stated, to undergo a serious surgical operation, and in December of that year he was formally superseded by Gen. Juan Vicente Gomez as president. Since then he has been prevented from returning to Venezuela. In March, 1909, the Venezuelans confirmed his temporary resignation of the presidency in 1906 by "constitutionally suspending" him and enacting his banishment.

CASTRO DEL RIO, a town in the province of Cordoba, Spain, 16 miles S. E. of the town of that name. It is picturesquely located on a slope above the Guadajoz, and is a prosperous and thriving town, with handsome private houses and public buildings. Its principal manufactures are linen, woolen, and earthen ware. It is an important market for the agricultural produce of the surrounding district. It has a beautiful church, two colleges, a hospital, and several convents. Pop. about 12,000.

CAT, the *Felis catus ferus*, a species of the genus *Felis*. The cat is originally from the European forests. In its wild state it differs from the domestic animal in having a shorter tail, a flatter and larger head, and stronger limbs. Its color is grayish-brown, with darker, transverse undulations. Its manners resemble those of the lynx, living in woods, and preying on young hares, birds, and a variety of other animals, which it seizes by surprise. At what period cats became inmates of human

habitations, it is scarcely possible, at this period, to determine, but there is good reason to believe that they were at first domesticated in Egypt. The cat belongs to a genus better armed for the destruction of animal life than all other quadrupeds. The short and powerful jaws, moved by vigorous muscles, are supplied with most formidable trenchant teeth; a cunning disposition, combined with nocturnal habits and much patience in pursuit, gives them great advantages over their prey; and their keen, lacerating claws enable them to inflict a certain death-blow. All animals considerably weaker than themselves prove objects of pursuit; but the mouse is their favorite game; for which they will patiently wait for a whole day till the victim comes within reach, when they seize it with a bound and after playing with it, put it to death. The pupil of the eye in most animals is capable of but a small degree of contraction and dilatation; it enlarges a little in the dark, and contracts when the light pours upon it too profusely; but in the eyes of cats, this contraction and dilatation is so considerable that the pupil, which by day appears narrow and small, by night expands over the whole surface of the eye-ball, and gives the eyes a luminous appearance. By means of this peculiar structure, their eyes are better adapted for vision at night than in the daytime; and they are thus fitted for discovering and surprising their prey. Personally, the cat is a very cleanly animal. The cat goes with young for 63 days and brings forth from three to six at a litter, which remain blind for nine days. The varieties of this animal in a domestic state are very numerous.

CATACOMBS, caves or subterranean places for the burial of the dead, the bodies being placed in graves or recesses hollowed out in the sides of the cave. Caves of this kind were common among the Phoenicians, Greeks, Persians, and many Oriental nations. In Sicily and Asia Minor numerous excavations have been discovered containing sepulchers, and the catacombs near Naples are remarkably extensive. Those of Rome, however, are the most important. The term *catacumbæ* is said to have been originally applied to the district near Rome which contains the chapel of St. Sebastian, in the vaults of which, according to tradition, the body of St. Peter was first deposited; but (besides its general application) it is now applied in a special way to all the extensive subterranean burial-places in the neighborhood of Rome, which extend underneath the town itself as well as the neighboring

country, and are said to contain not less than 6,000,000 tombs. They consist of long, narrow galleries usually about 8 feet high and 5 feet wide, which branch off in all directions, forming a perfect maze of corridors. Different stories of galleries lie one below the other. Vertical shafts run up to the outer air, thus introducing light and air, though in small quantity. The graves or *loculi* lie longwise in the galleries. They are closed laterally by a slab. The earliest that can be dated with any certainty belongs to the year 111 A. D.

In early times rich Christians constructed underground burying-places for themselves and their brethren, which they held as private property under the protection of the law. But in course of time, partly by their coming under the control of the Church and partly by accidents of proprietorship, these private burying-grounds were connected with each other, and became the property, not of particular individuals, but of the Christian community. In the 3d century A. D. there were already several such common burying-places belonging to the Christian congregations, and their number went on increasing till the time of Constantine, when the catacombs ceased to be used as burying-places.

From the time of Constantine down to the 8th century they were used only as places of devotion and worship. During the siege of Rome by the Lombards in the 8th century the catacombs were in part destroyed, and soon became entirely inaccessible, so that they were forgotten, and only the careful and laborious investigations of moderns, among whom De Rossi (*Roma Sotterranea*) and Parker (*The Catacombs*) may be mentioned, have thrown anything like a complete light on the origin and history of the catacombs. There are extensive catacombs at Paris, consisting of old quarries from which has been obtained much of the material for the building of the city. In them are accumulated bones removed from cemeteries now built over.

CATALEPSY, a form of mental disorder, akin to hysteria, which is characterized by the person affected falling down suddenly in a state of real or apparent unconsciousness, and, save for some occasional muscular twitchings of the face and body, remaining rigid and statue-like for a period of time which varies from one minute to some hours or even days, and then all at once recovering consciousness as if aroused from sleep—as a rule with no bad consequences to follow. Catalepsy almost invariably affects hysterical people only, and it is the prolongation of the un-

conscious condition to some days in certain extreme cases which has given rise to the fear which some people have of being buried alive under such circumstances.

CATALONIA (*ancient Hispania Tarraconensis*), an old province of Spain, bounded N. by France, E. and S. E. by the Mediterranean, S. by Valencia, and W. by Aragon. The country in general is mountainous, but intersected with fertile valleys, while the mountains themselves are covered with valuable woods and fruit-trees, the slopes being cut in terraces and plentifully supplied with water by an artificial system of irrigation. Wheat, wine, oil, flax, hemp, vegetables, and almost every kind of fruit are abundant. There are mines of lead, iron, alum, etc. On the coast is a coral-fishery. Catalonia, though less fertile than most of Spain, stands pre-eminent for the industry of its inhabitants, who speak the Catalan dialect. Pop. about 2,150,000; area, 12,480 square miles. It comprises the modern provinces of Tarragona, Gerona, Lerida, and Barcelona.

CATAMARAN, a kind of boat, vessel, or, more accurately, raft or float used by the Hindoos of Madras, the island of Ceylon, and the parts adjacent. It is formed of three logs of timber, secured together by means of three spreaders and cross lashings through small holes. The central log is much the largest, with a curved surface at the fore-end, which terminates upward in a point. The side logs are very similar in form, but smaller, and with their sides straight; these are fitted to the central log. The length of the whole is from 20 to 25 feet. The crew consists of two men. In the monsoons, where a catamaran is able to bear a sail, a small outrigger is placed at the end of two poles as a balance, with a bamboo mast and yard, and a mat or cotton sail. Frail as such a structure may appear, it can pierce through the surf on the beach at Madras and reach a vessel in the bay when a boat of ordinary construction would be sure to founder.

CATAMARCA, a W. province of the Argentine Republic, sinking S. E. from the Andes to the salt marshes which separate it from Cordoba. Almost two-thirds of its surface is mountain or waterless desert, where the rivers are lost in the sands; but the remainder is very fertile, and yields much wine and corn, besides supporting large herds of cattle. Only copper has been much mined. Area, 36,800 square miles; pop. about 106,000. Catamarca (pop. about 10,000), the capital, lies 82 miles N. E. of Rioja.

CATANIA (*ancient Catāna*), a city on the E. coast of Sicily, the capital of the province of Catania (area, 1,907 square miles; pop. about 850,000), at the foot of Mount Etna. It has been repeatedly visited by tremendous earthquakes, and has been partially laid in ruins by lava from eruptions of Mount Etna; but it has always revived, and has much more the features of a metropolis than Palermo. Most of the edifices have an air of magnificence unknown in other parts of the island. The cathedral, founded by Count Roger in 1094, is a fine building. The manufacture of silk, linen, and articles in lava, amber, etc., constitutes the chief industry. The ruins of the amphitheater, which was more extensive than the Colosseum at Rome, are still to be seen, as also the remains of the theater, baths, aqueducts, sepulchral chambers, hippodrome, and several temples. The harbor was choked up by the eruption of 1669, so that for the larger vessels there is nothing but a roadstead. In spite of this Catania has a considerable trade, and exports wheat, barley, wine, oil, etc. It is the seat of a bishop and of a university, founded in 1445. Pop. about 220,000.

CATANZARO (*ancient Catacium*), a city of Italy, capital of the province of the same name, located 8 miles from the Gulf of Squillace. It contains a cathedral, an academy of sciences, a lyceum and three hospitals. Situated on a height, it is cool in summer and a desirable place of residence. There is a considerable trade in wines, wheat, and oils, and the chief manufactures are silk and velvet. Pop. about 40,000.

CATARACT, an affection of the sight, in which the crystalline lens of the eye is more or less permeated by opaque matter, and objective vision either wholly or partially prevented. Cataract is of two kinds, viz., hard and soft. Hard cataract is most common among old people. Soft may occur at any age, but is found most frequently among children, and especially among those who have been born with this condition; in the latter case it is called congenital cataract. Traumatic cataract is so called when it is the result of a wound of the lens. Cataract is very recognizable in children, in whom it presents a bluish-white appearance like milk and water in the pupil of the eye; in aged persons the color is much darker and less distinct, and therefore more difficult to see, but a careful examination will detect the opacity in the lens. Cataract is usually amenable to surgical treatment.

CATARACT. See WATERFALL.

CATEAU, LE, or CATEAU-CAMBRESIS, (*katō*), a town in the French department of Nord, on the Selle, 14 miles E. S. E. of Cambrai. Pop. about 10,000. Here in 1559 the treaty of Cateau-Cambresis was concluded between Henry II. of France and Philip II. of Spain.

CATHARINE, the name of several Christian saints: (1) St. Catharine proper, a virgin of royal descent in Alexandria, who publicly confessed the Gospel at a sacrificial feast appointed by the Emperor Maximinus, and was therefore put to death, after they had vainly attempted to torture her on toothed wheels, 307 A. D. Hence the name of Catharine wheel. St. Catharine's festival falls on Nov. 25. (2) St. Catharine of Sienna, one of the most famous saints of Italy, was the daughter of a dyer in Sienna, and was born there in 1347. While yet a child she practiced extraordinary mortifications, and devoted herself to perpetual virginity. She became a Dominican, and therefore afterward a patron saint of the Dominicans. She was given, it was said, extraordinary tokens of favor by Christ, whose Stigmata were imprinted upon her body. She wrote devotional pieces, letters, and poems, an edition of which is Tomasseo's (Florence, 1860). Her festival falls on April 30. St. Catharine of Genoa (1447-1510), festival March 22 or Sept. 5; St. Catharine of Bologna (1413-1463), festival March 9; and St. Catharine of Sweden (1331-1381), festival March 22, are of less note.

CATHARINE I., Empress of Russia and wife of Peter the Great, was a woman of humble origin, who, having become mistress to Prince Menschikoff, was relinquished by him to the Czar. In 1708 and 1709 she bore the Emperor the Princesses Anna and Elizabeth, the first of whom became the Duchess of Holstein by marriage, and mother of Peter III. The second became Empress of Russia. In 1711 the Emperor publicly acknowledged Catharine as his wife, and she was subsequently proclaimed empress, and crowned in Moscow in 1724. When Peter with his army seemed irreparably lost on the Pruth in 1711 Catharine secured the relief of her husband by bribing the Turkish general. At Peter's death in 1725 Catharine was proclaimed Empress and autocrat of all the Russias, and the oath of allegiance to her was taken anew. Catharine died suddenly in 1727, her death having been hastened by dissipation.

CATHARINE II., Empress of Russia, was born in 1729, her father being Christian Augustus, Prince of Anhalt-

Zerbst. In 1745 she was married to Peter, nephew and successor of the Russian Empress Elizabeth. In danger of being supplanted by his mistress, the Countess Woronzoff, Catharine, with the assistance of her lover, Gregory Orloff, and others, won over the guards and was proclaimed monarch (July, 1762). Peter attempted no resistance, abdicated almost immediately, and was strangled in prison a few days later, apparently without Catharine's knowledge. By bribes and threats she readily secured her position, and at once entered upon



CATHARINE II. OF RUSSIA

the administration with great and far-seeing activity. On the death of Augustus III. of Poland she caused her old lover, Poniatowski, to be placed on the throne with a view to the extension of her influence in Poland, by which she profited in the partition of that country in the successive dismemberments of 1772, 1793, and 1795. By the war with the Turks, which occupied a considerable part of her reign, she conquered the Crimea and opened the Black Sea to the Russian navy. Her dream, however, of driving the Turks from Europe and restoring the Byzantine Empire was not to be fulfilled. Her relations with Poland and with other European powers induced her to make peace with Turkey in 1792 and accept Dniester as the boundary line between the two countries. She succeeded, at least partially, in improving the administration of justice,

ameliorated the condition of the serfs, constructed canals, founded the Russian Academy, and in a variety of ways contributed to the enlightenment and prosperity of the country. Her enthusiasm for reform, however, was summarily checked by the events of the French revolution; and the dissipation and extravagance of her court were such that there was even a danger of its exhausting the empire. Of her many lovers Potemkin was longest in favor, retaining his influence from 1775 till his death in 1791, directing Russian politics throughout that period in all essential matters. She died in 1796.

CATHARINE DE' MEDICI (*dā-med' ē-chē*), wife of Henry II., King of France, born at Florence in 1519, the only daughter of Lorenzo de' Medici, duke of Urbino, and the niece of Pope Clement VII. She was married to the Duke of Orleans, afterward Henry II., in 1533, but had little or no influence at the French court either during the reign of her husband, who was under the influence of his mistress Diana de Poitiers, or during the reign of her eldest son, Francis II., who, in consequence of his marriage with Mary Stuart, was devoted to the party of the Guises. The death of Francis placed the reins of government during the minority of her son, Charles IX., in her hands. Wavering between the Guises on one side, who had put themselves at the head of the Catholics, and Condé and Coligny on the other, who had become very powerful by the aid of the Protestants, she played off one faction against the other in the hope of increasing her own power; and the 30 years of civil war which followed were mainly due to her. Her influence with Charles IX. was throughout of the worst kind, and the massacre of St. Bartholomew's Day was largely her work. After the death of Charles IX., in 1574, her third son succeeded as Henry III., and her mischievous influence continued. She died in 1589, shortly before the assassination of Henry III. Of her two daughters, Elizabeth married Philip II. of Spain, and Margaret of Valois married Henry of Navarre, afterward Henry IV.

CATHARINE HOWARD, Queen of England. See HOWARD.

CATHARINE OF ARAGON, Queen of England, the youngest daughter of Ferdinand of Aragon and Isabella of Castile, born in 1485. In 1501 she was married to Arthur, Prince of Wales, son of Henry VII. Her husband dying about five months after, the king, unwilling to return her dowry, caused her to be mar-

ried to his remaining son, Henry, and a dispensation was procured from the Pope for that purpose. On his accession to the throne as Henry VIII. in 1509 she was crowned with him, and despite the inequality of their ages retained her ascendancy with the king for nearly 20 years. Her children, however, all died in infancy, excepting Mary, and on the advent of Anne Boleyn, Henry affected to doubt the legality of his union with Catharine. He applied therefore to Rome for a divorce, but the attitude of the papal court ultimately provoked him to throw off his submission to it, and declare himself head of the English Church. In 1532 he married Anne Boleyn; upon which Catharine, no longer considered Queen of England, retired to Ampthill in Bedfordshire. Cranmer, now raised to the primacy, pronounced the sentence of divorce, notwithstanding which, Catharine still persisted in maintaining her claims, showing from first to last a firm and dignified spirit. She died in January, 1536.

CATHARINE OF BRAGANZA, wife of Charles II., King of England, and daughter of John IV., King of Portugal, was born in 1638. In 1662 she married Charles II., but her husband's infidelities and neglect, and her childlessness, were a source of mortification to her. In 1693 she returned to Portugal, where, in 1704, she was made regent, and in the conduct of affairs during the war with Spain showed marked ability. She died in 1705.

CATHARINE PARR. See PARR.

CATHEDRAL, the Cathedral city is the seat of the bishop of the diocese, and his throne is placed in the Cathedral church, which is the parish church of the whole diocese. The distinction between Cathedral and collegiate churches consists principally in the see of the bishop being at the former. The governing body of a Cathedral is called the dean and chapter. St. Peter's, at Rome, is unequalled in magnitude and splendor by any other Christian fane in the world. The Cathedral of St. John the Divine (P. E.), in New York, will, when completed, be the most ambitious structure of the kind on this continent.

CATHEDRAL PEAK, a peak of the Sierra Nevada Range, situated in Mariposa co., Cal. It is of granite formation and contains the source of the Merced river. Height, 11,000 feet.

CATHERWOOD, MARY HARTWELL, an American writer, born in Luray, O., Dec. 16, 1847. She wrote "Craque-o'-Doom," "The Romance of

Dollard," "The Story of Tonty," "A Woman in Armor," "The Lady of Fort St. John," "The Chase of St. Castin, and Other Tales," "The Spirit of an Illinois Town," "The White Islander," and other novels. She died in 1902.

CATHOLIC CHURCH, the universal Church, the whole body of true believers in Christ; but the term is often used as equivalent to the Roman or Western Church.

Like most other words used in ecclesiology, the term Catholic was borrowed at first from the New Testament. It occurs in some editions of the Greek original, in the titles prefixed to the Epistles of James, I and II Peter, I John, and Jude, and is the word translated "general" in the Authorized Version of the Bible. The first to apply it to the Church was the Apostolic Father Ignatius. When he and his successors used it they meant to indicate that the Church of which they constituted a part comprised the main body of believers, and was designed, as it was entitled, to be universal. In this sense the Church was opposed to the sects and separate bodies of heretics who had separated themselves from it and were now outside its pale.

When, in the 8th century, the separation between the Eastern and Western Churches took place, the latter retained as one of its appellations the term "Catholic," the Eastern Church being contented with the word "Orthodox."

When the Protestant churches separated from their communion with Rome in the 16th century, those whom they had left naturally regarded them as outside the Catholic pale. They, on the other hand, declined to admit that this was the case, and the term "Catholic Church" is used in the English Liturgy apparently in the sense of all persons making a Christian profession. "More especially we pray Thee for the good estate of the Catholic Church . . . that all who profess and call themselves Christians. . . ." See ROMAN CATHOLIC CHURCH.

CATHOLIC SUMMER SCHOOL OF AMERICA, a school under the auspices of the Roman Catholic Church, founded at Cliff Haven, near Plattsburg, Lake Champlain, N. Y. In general the studies resemble those of the Chautauqua Summer School. There are courses in history, literature, philosophy, political science, and religion. Lessons are held from July to September of each year, and the work is continued by means of reading and study clubs.

CATHOLIC UNIVERSITY OF AMERICA, an institution in Washington, D. C., founded in 1889, under the

auspices of the Roman Catholic Church, for postgraduate study exclusively. At the close of the school year 1919 the university reported: professors and instructors, 87; students, 1,835; president, Rev. T. J. Shaham.

CATILINE (LUCIUS SERGIUS CATILINA), a Roman conspirator, of patrician rank, born about 108 B. C. In his youth he attached himself to the party of Sulla, but his physical strength, passionate nature, and unscrupulous daring soon gained him an independent reputation. Despite the charges of having killed his brother-in-law and murdered his wife and son, he was elected *prætor* in 68 B. C., and governor of Africa in 67. In 66 B. C. he returned to Rome to contest the consulship, but was disqualified by an impeachment for mal-administration in his province. Urged on by his necessities as well as his ambition, he entered into a conspiracy with other disaffected nobles. The plot, however, was revealed to Cicero, and measures were at once taken to defeat it. Thwarted by Cicero at every turn, and driven from the Senate by the orator's bold denunciations, Catiline fled, and put himself at the head of a large but ill-armed following. The news of the suppression of the conspiracy and execution of the ringleaders at Rome diminished his forces, and he led the rest toward Gaul. Metellus Celer threw himself between the rebels and their goal, while Antonius pressed upon their rear, and, driven to bay, Catiline turned upon the pursuing army and perished fighting (62 B. C.).

CAT ISLAND, the name of several islands. (1) Cat Island, or Guanahani, an island of the Bahama group for centuries supposed to be identical with the San Salvador of Columbus, a surmise now disproved. Length, 36 miles; breadth, 3 to 7 miles; pop. about 2,500. (2) A steamboat landing on the Mississippi, in Crittenden co., Ark. (3) An island of Lake Huron, Canada, between Horse Island and the Isle of Cove. (4) An island at the mouth of Lake Borgne, La.

CATLIN, GEORGE, an American author and painter, born in Wilkes-Barre, Pa., June 26, 1796. From 1832 till 1839 he traveled and lived among the Indians of America, of whom he painted hundreds of portraits, most of which are now owned by the Federal Government and form the famous Catlin Gallery of the National Museum. He published "Illustrations of the Manners, etc., of the North American Indians," and subsequently, "Life Among the Indians,"

and "The Breath of Life." He died in 1872.

CATO, MARCUS PORCIUS, the Censor, surnamed Priscus, the Wise and the Elder, a celebrated Roman, born in Tusculum, in 234 B. C. He inherited from his father, a plebeian, a small estate in the territory of the Sabines, which he cultivated with his own hands. By the advice of Valerius Flaccus he removed to Rome, where his forensic abilities had free scope. He rose rapidly, accompanied Scipio to Sicily as *quaestor* in 204 B. C., became an *ædile* in 199, and in 198 was chosen *prætor*, and appointed to the province of Sardinia. Three years later he gained the consulship, and in 194 for his brilliant campaign in Spain obtained the honor of a triumph. In 191 he served as military tribune against Antiochus, and then, having abundantly proved his soldierly qualities, returned to Rome.

For some years he exercised a practical censorship, scrutinizing the characters of candidates for office, and denouncing false claims, speculations, etc. His election to the censorship in 184 set an official seal to his efforts, the unsparing severity of which has made his name proverbial. From that year until his death he held no public office, though zealously continuing his unofficial labors for the state. His hostility to Carthage, the destruction of which he advocated in every speech made by him in the forum, was the most striking feature of his closing years. His incessant "Delenda est Carthago" (Carthage must be destroyed) did much to further the third Punic war. Of his works his "De Re Rustica" (On Rural Economy) alone survives, though there exist in quotation fragments of his history and speeches. He died 149 B. C.

CATO, MARCUS PORCIUS, surnamed the Younger or Uticensis (from Utica, the place of his death), the great-grandson of Cato the Censor, was born 95 B. C. Even when a boy, he is said to have given indications of sturdy independence. Taking his great ancestor as his model, he adopted his principles and imitated his conduct. He commenced his military career in 72 B. C., as a volunteer, in the servile war of Spartacus; and afterward earned a high reputation as a military tribune in Macedonia. After some time spent in the study of stoicism, his favorite philosophy, and in diligent preparation for the duties of official life, he was elected *quaestor* for 65 B. C.; and acting on the principles which he had prescribed to himself, corrected various abuses which had been sanctioned by his predecessors. As the supporter of Cicero, in

63 B. C., in all his measures for suppressing the Catilinarian conspiracy, he decided by his speech, on the 5th of December, the motion that the conspirators should be put to death. Along with the senatorial party he strenuously opposed the coalition of Cæsar, Pompey, and Crassus, in 60 B. C., but the supporters of the triumvirate dexterously removed him from the scene of action by conferring upon him an appointment which called him first to Cyprus, and afterward to Byzantium. When prætor, in 54 B. C., he was exposed to the outrages of the mob, in consequence of his endeavors to put a stop to the bribery and corruption which prevailed. On the commencement of the civil war, 49 B. C., Cato joined the party of Pompey, and after the battle of Pharsalia, he retired to Africa, whither he had thought Pompey had fled, and endured, with his troops, great hardships in marching across the desert to join Scipio at Utica, with whom he had some contest about the mode of carrying on the war. Cato also gave offense to that general by sparing those inhabitants of Utica who were attached to Cæsar. When that conqueror came before the place Cato retired to his chamber, and after reading Plato's "Phædo, or Dialogue on the Immortality of the Soul," fell upon his sword, 45 B. C.

CATORCE (kat-or'sä), a mining town of San Luis Potosi, Mexico. It contains valuable silver mines, formerly very productive, now pretty well worked out. Pop. 18,000.

CATSKILL, a village and county-seat of Greene co., N. Y., on the W. side of the Hudson river and on the West Shore and the Catskill Mountain railroads; also connected with the New York Central by a ferry crossing the Hudson, 30 miles S. of Albany. It is a noted mountain summer resort, and has a court house, opera house, free academy, banks, several public schools, weekly newspapers, manufacturers and hotels. Pop. about 5,100.

CATSKILL MOUNTAINS a chain of the Appalachian system, beginning in Greene co., N. Y., on the W. side of the Hudson river. The scenery of these mountains is remarkably picturesque and beautiful, while from the higher points may be seen extensive and interesting views, taking in a radius from the Green Mountains of Vermont to the West Point Highlands. An interesting natural development is the "Caaterskill Clove," in which two streams unite in an unbroken fall of 180 feet, afterward rushing over falls of 80 and 40 feet. During the winter this fall presents a

wonderful appearance. The highest peaks are Slide Mountain (4,204 feet) and Hunter Mountain (4,025 feet). To this region numbers of summer guests repair yearly, living in farmhouses or hotels. Railroads have been built among the mountains. The mountains are thickly wooded with oak, hickory, ash, pine, beech, and maple trees.

CATT, CARRIE LANE CHAPMAN, an American woman suffrage leader; born at Ripon, Wis. She was educated at the State Industrial College of Iowa. She was principal of the high school at Mason City, Ia., where in 1884 she was married to Leo Chapman. He died two years later and in 1891 she was married to G. W. Catt. She devoted the greater part of her life to woman suffrage work, and traveled extensively in the interest of the movement through this country and Europe. An excellent administrator and effective platform speaker, she was chosen president of the International Woman Suffrage Alliance in 1904, and of the National American Woman Suffrage Association in 1915. She was the leader in the campaign for the woman suffrage amendment to the Federal Constitution passed by Congress in 1919.

CATTARO, a strongly fortified port in the former Austrian crown-land of Dalmatia, at the head of the Gulf of Cattaro, 40 miles S. E. of Ragusa, under the steep Montenegrin hills. Cattaro has a cathedral, a naval school, and a population of about 7,500, chiefly engaged in the Montenegrin trade. At one time the capital of a small republic, the town in 1420 joined the Republic of Venice, and after varied fortunes was handed over to Austria in 1814 by the Treaty of Vienna. During the WORLD WAR (q. v.) Cattaro was bombarded several times. As a result of the peace treaty between the Entente Powers and Austria-Hungary it became part of Jugoslavia. The Gulf of Cattaro, an inlet of the Adriatic, consists of three basins or lakes, connected by straits of about half a mile in breadth. Its length is 19 miles, and its depth from 15 to 20 fathoms.

CATTEGAT, or **KATTEGAT**, the bay or arm of the sea between the E. coast of Jutland and the W. coast of Sweden, to the N. of the Danish islands. It is connected with the Baltic Sea by the Great and Little Belt, and by the Sound, and the Skager Rack connects it with the North Sea. The length of the Cattegat is about 150 miles, and its greatest breadth 85 miles. Its greatest depth is 36 fathoms, but it has numerous sand-

banks, and navigation is rendered more dangerous by its strong currents and violent storms. The Danish shores are low, with stretches of sand or reefs, but the Swedish shore is very steep and rocky.

CATELL (JAMES) MCKEEN, an American psychologist, born in Easton, Pa., May 25, 1860, graduated at Lafayette College in 1880, and studied at Leipsic, Paris, Geneva and Göttingen. He was assistant under Wundt at the University of Leipsic, Professor of Psychology in the University of Pennsylvania in 1888-1891, and Professor of Experimental Psychology in Columbia University from 1891 to 1917. He was co-editor of the "Psychological Review," "Science," etc., and a member of many scientific associations.

CATTLE, a collective term, denoting all animals of the bovine or ox kind. In the United States vast areas of grazing land in the Western States and Territories have been acquired by syndicates for the breeding and rearing of cattle; and with the view of improving the stock of native cattle, large numbers of well-bred bulls of the leading British varieties, either imported from the United Kingdom or descended from imported stock, have been sent to the West for use on ranches.

The production of cattle in order to insure an adequate meat supply was one of the most important problems to be solved during the World War. The total amount of cattle in nine important countries of Europe before the war was 65,205,000. After the war the total had been reduced to 58,163,000. On the other hand, in the United States before the war there were 56,592,000 cattle and after the war 67,866,000, or an increase of nearly 20 per cent. Increases were also shown in Canada, Argentina, and New Zealand, while there was a loss in Australia. The total number of cattle in the countries named numbered before the war, 102,157,000 and after the war, 118,895,000, or an increase of nearly 16 per cent. There was a total gain in the number of cattle in all countries considered, of 9,096,000 cattle. The condition of cattle in Europe, however, was such that the stocks were not available either for dairy or meat production, on account of the prevailing shortage of food supplies and the widespread prevalence of foot and mouth disease. For consideration of the meat industry in the United States, see **PACKING INDUSTRY**.

CATTLE-PLAQUE, any plague by which large numbers of cattle are destroyed. Such plagues have existed at intervals, more or less, in all countries

and in all ages. Among the severer visitations in centuries preceding the 19th may be mentioned a great plague which arose in Hungary in 1711, whence it spread to other countries, destroying in the next three years about one and a half millions of cattle. A second visitation, which affected England and the W. of Europe, between 1745 and 1756, caused the death of about three millions of cattle.

The name is given in the United States specifically to the disease known as "Texas fever," the scientific name of which is *pleuro-pneumonia*. Although this pest has from time to time broken out endemically, there has never been any general epidemic here such as has afflicted other countries. The appellation "cattle plague" is also loosely given to another disease among cattle in the United States, which is otherwise known as "lumpy-jaw," a most virulent and incurable affection. Experiments have been time and again ineffectually tried to find a cure for this, though large governmental encouragement has been offered. A rigid examination of cattle is made by government inspectors at all receiving and shipping ports.

CATULLUS, CAIUS VALERIUS (kat-ul'us), a Roman lyric poet, born in Verona, about 90 B. C. He was the friend of Cicero, of Plancus, Cinna, and Cornelius Nepos; to the last he dedicated the collection of his poems. Almost all the known details of his life are derived by inference from his works, and relate to such matters as his passion for Lesbia, his journey to Bithynia, and voyage home in his yacht, his pleasant villa on Lake Benacus, etc. He was the first of the Romans who successfully caught the Greek lyric spirit, and gave to Roman literature its most genuine songs. He died about 54 B. C.

CAUCA, a river of Colombia, in South America, which, after a N. course of 600 miles, falls into the Magdalena. Its valley is one of the richest and most populous districts of the continent, and it gives name to one of the Colombian departments traversed by the Andean coast-range, and extending along the Pacific from Panama to Ecuador; area, 20,403 square miles; pop. about 215,000. It is rich in minerals. Capital, Popayán.

CAUCASIA, a sub-division of Russia, between the Black and Caspian Seas, and extending from the frontier of Persia on the S. to the Kuma-Manych depression on the N. The Caucasus Mountains divide the territory into *Cis-caucasia* and *Trans-caucasia*. The total area of Caucasia, the two parts being nearly

equal, is 181,173 square miles, and the population, Trans-caucasia being the more thickly settled, about 13,500,000.

CAUCASIAN RACE, the white man, one of the three more remarkable varieties of the species Man, the two others being the Yellow, or Mongolian, and the Black, or Ethiopian. The Caucasian Race occupies all Europe and western Asia as far as the Ganges, likewise northern Africa, and the greater part of America. To it belong the more highly civilized nations. The region of the Caucasus has been supposed to have been the cradle of the race, hence its name. A fair skin, elevated forehead, small cheek-bones, hair varying in color, but always smooth or wavy, together with high intellectual qualities, characterize the race.

CAUCASUS, a chain of mountains lying to the S. E. of Russia Proper, between the Black Sea and the Caspian. It traverses the former Russian province of Caucasia (now the Kuban, Georgian, and Azerbaijan republics) from N. W. to S. E. through a length of 700 miles. It does not form a single chain, but is divided for part of its length into two, three, or four chains, which sometimes run parallel to one another, and sometimes meet and form mountain ganglions. The heights of the chief summits are Elbruz, 18,572 feet; Koshtan-tau, 17,123; Dych-tau, 16,928; Kasbek, 16,546. Those mountains, as they lie N. of the Caucasian watershed, are to be looked upon as European. The chief rivers are the Terek and Kur, flowing into the Caspian, and the Kuban and Rion (*ancient Phasis*) into the Black Sea. The N. part of the country produces little but grass, but the slopes and valleys on the S. and especially those nearest the Black Sea, produce various kinds of fruits, grain of every description, rice, cotton, hemp, etc. The minerals are valuable. At Baku on the Caspian immense quantities of petroleum are obtained. The inhabitants consist of small tribes of various origin and language—Georgians, Abassians, Lesghians, Ossetes, Circassians, Tartars, Armenians, etc. Some of them are Greek and Armenian Christians, others are Mohammedans, Jews, etc.

CAUCUS, in the political nomenclature of the United States, a gathering preliminary to a public meeting of citizens for election or for other purposes, generally political; a private conclave designated to influence the general body of the citizens. Also a secret preliminary meeting of the leaders of a political party to determine on a course of action,

the conclusions of the Caucus being binding on all the members.

CAUDINE FORKS, a pass of southern Italy, in the form of two lofty fork-shaped defiles, in the Apennines (now called the valley of Arpaia), into which a Roman army was enticed by the Samnites, 321 B. C., and being hemmed in was forced to surrender.

CAULIFLOWER, an esculent vegetable consisting of the fleshy, young, undeveloped inflorescence of a variety of *Brassica oleracea*, hardly different from broccoli, except in being whiter and less hardy. It is said to have been imported from Cyprus about the middle of the 16th century. A very rich, light, warm soil is required for cauliflower, which must be sown in beds, and afterward transplanted into sheltered situations, where they can be protected when young with hand-glasses. They are sown in August for a spring crop, in February for a summer crop, and in May in order to come in at the end of autumn and beginning of winter. The cauliflower is a light, easily digested, and nutritious vegetable aliment.

CAULKING, of a ship, driving a quantity of oakum into the seams of the planks in the ship's decks or sides in order to prevent the entrance of water. After the oakum is driven very hard into these seams it is covered with hot melted pitch to keep the water from rotting it.

CAURA (kō'ra), a river of Venezuela, over 400 miles long, rises among the sierras of the frontier, and flows N. N. W. to the Orinoco.

CAUTERETS, a watering-place in the department of Hautes-Pyrénées, France, 3,250 feet above sea-level, in the valley of the Laverdan, 42 miles S. S. E. of Pau. The stationary population of the place is only about 1,500, but it is annually swelled in summer by about 50,000 visitors, for whose accommodation numerous sumptuous hotels and bathing establishments have been built. It is a good center and guide-station for ascents among the Pyrenees. The sulphurous springs, 25 in number, and varying in temperature from 60° to 131° F., are the most abundant in the Pyrenees (330,000 gallons per day), and have been known from Roman times; though their modern reputation dates from the 16th century, when Margaret, sister of Francis I., held her literary court and wrote much of her "Heptameron" at Cauterets.

CAUTIN, a river in Chile; flows W. through a province named after it, and

empties into the Pacific Ocean. Its length is about 200 miles. The province of Cautin has an area of 6,381 square miles; pop. about 165,000; capital, Temuco (pop. about 32,000).

CAUTO, a river of Cuba, rising in the province of Santiago de Cuba, and after a northwesterly course of about 20 miles, flowing W. into Buena Esperanza Bay. It is about 125 miles long and is navigable for small boats for about 75 miles.

CAVA DEI TIRRENI, an Italian city in the southern province of Salerno, situated three miles N. W. of the city of that name. It contains a cathedral, several other churches, a seminary and a convent. The principal manufactures are silk, cotton, and linen. About a mile from the town is the great Benedictine Convent of the Trinity, founded by St. Alferius in 1025. The town is a popular spring and summer resort. Pop. about 24,000.

CAVAIGNAC, LOUIS EUGÈNE, a French general, born in Paris, Oct. 15, 1802. His father, Jean Baptiste Cavaignac, was a furious revolutionist and member of the Council of Five Hundred. Young Cavaignac in 1824 joined the 2d Regiment of Engineers, and being at Arras on the outbreak of the revolution of 1830, he was the first officer in his regiment to declare for the new order of things. In 1832 he was sent to Africa, where he remained for several years, and greatly distinguished himself. When the revolution of 1848 broke out Cavaignac was appointed Governor-General of Algeria; but on being elected a member of the Constituent Assembly he returned to Paris and was appointed Minister of War. At the outbreak of the June insurrection Cavaignac was appointed dictator, with unlimited powers. By the energy of Cavaignac, aided by the loyalty of the army and the National Guard, the insurrection was suppressed. Toward the close of the year he became a candidate for the presidency of the republic, but was defeated by Louis Napoleon. After the *coup d'état* of Dec. 2, 1851, he was arrested and conveyed to the fortress of Ham, but was liberated after about a month's detention. In 1852 and in 1857 he was elected member for Paris of the legislative body, but on both occasions was incapacitated from taking his seat by refusing to take the oath of allegiance to the Emperor. He died in Sarthe, Oct. 28, 1857.

CAVALCANTI, GUIDO (*kav-al-kan'-tē*), a Florentine poet, born about 1246. He married Beatrice, daughter of Farnata degli Uberti (chief of the Ghibel-

line faction at Florence); but he himself seems to have had leanings toward the Guelph party; for, becoming too intimate with the followers of the Cerchi, he was banished (June 24, 1300), along with the others, to Sarzana. As a poet he was, until the coming of Dante, the head of that school of poetry which had been founded by Guinelli of Bologna, a school which delighted in philosophical, mystical sentiment. His writings are confined chiefly to sonnets, canticles, and ballads. His best known poem is his canzone on the "Nature of Love." Among his contemporaries his epicurean philosophy gained him suspicion of atheism. Cavalcanti's friendship with Dante, one of the most interesting things about his life, took the delightful form of exchange of sonnets; and to it we owe some of the most delicate work of both. He died in Florence in 1300.

CAVALRY, a body of troops which serve on horseback, one of the three great classes of troops, and a formidable power in the hands of a leader who knows how to employ it with effect. Its adaptation to speedy movements is a great advantage, which enables a commander to avail himself immediately of a decisive moment, when the enemy exposes a weak point, or when disorder appears in his ranks. It is a very important instrument in completing the defeat of an enemy, in disconcerting him by a sudden attack, or overthrowing him by a powerful shock. It is very serviceable in protecting the wings and center of an army, for escorts, for blockading, for intercepting the supplies of the enemy, for procuring intelligence, for covering a retreat, for foraging, etc.

The employment of cavalry in modern armies is limited chiefly to scouting purposes. While there were large bodies of cavalry in the various armies during the World War, it was only in rare and exceptional circumstances that these were employed on a large scale in attack. Even in reconnoitering cavalry has been largely superseded by motorcycles.

The armies reconstructed after the World War, however, still included a comparatively large number of cavalry regiments. For the number and position of these regiments in the United States army, see **MILITARY ORGANIZATION, UNITED STATES**.

CAVAN, a county in the province of Ulster, Ireland, having Longford and Westmeath on the S., Fermanagh and Monaghan on the N., Louth on the E., and Leitrim on the W. Area, 746 square miles. It is traversed by a number of rivers, of which the chief are the Blackwater, the Erne, the Annalee, and the

Woodford. The county is also interspersed by several lakes, Ramor, Sheelin, Gowna, and Oughter. The main crops are oats and potatoes, the ground being too wet and cold for diversified agriculture, although there is good grazing in the higher portions. The manufacture of linen and the distilling of whiskey are the chief industries. Pop. about 90,000, of whom about four-fifths are Catholics. The county sends two members to Parliament. The town of Cavan (pop. about 3,000) is the business center and county-seat.

CAVEAT (L., "let him beware"), in law, a process in a court to stop proceedings, as to prevent the enrollment of a decree in chancery in order to gain time to present a petition of appeal to the Lord-Chancellor. In the United States this name is given to a notice lodged in the patent-office by a person who wishes to patent an invention, but desires to be protected till he has perfected it. It stands good for a year, and may be renewed. See PATENT.

CAVE DWELLERS, prehistoric men dwelling in caves, and cave-dwelling animals of corresponding periods; also cave-dwelling men of more recent historic times. Long before the dawn of authentic history, primitive races of men dwelt in large numbers in natural caverns, which were often shaped, enlarged, fortified, or furnished by the occupants. The ages in which the prehistoric cave dwellers lived are usually called the Paleolithic, or ancient stone age, and the Neolithic, or later stone age. Some of the caves have been found and explored in England, France, Belgium, Spain, America, and Australia; notably a famous cave known as Kent's Hole in Devonshire, Eng.; caves at Brixham and Perigord, and the Madeleine cave on the Vézère river, France. In the Neolithic age numerous human skeletons are found, but very few in the earlier age. It is believed that some of these human remains possibly antedate the glacial drift period of Europe. Implements of flint and stone are mingled with the remains. Rude carvings on stone and ivory, and on the antlers of animals have been found. Among the animals known to have dwelt in the caves with men, or to have been carried there for food, or to furnish their skins for clothing, are the cave bear, and cave lion, the mammoth, musk ox, horse, dog, bison, rhinoceros, and hyena. Needles of ivory are found, leading to the inference that they knew how to sew skins together for garments. No traces of agriculture, and no implements used in agriculture have

been discovered. Lance heads, arrow heads, hammers, saws made of flint, and harpoons, have been found.

In the cave of Cro-Magnon in the S. of France skeletons were found that are accepted by paleontologists as those of genuine cave men. Taking them as the type it is inferred that the Paleolithic cave dwellers were a tall, powerfully built race, with long, narrow skulls, broad faces, and powerful jaws. Investigations in the Belgian caves seem to indicate that the cave men of that region were of much smaller stature, but with symmetrical, well-shaped bodies.

The caves belonging to the Neolithic age yield remains classified into three ages: Neolithic (proper), bronze, and iron. They are widely distributed throughout Europe, and contain celts, flints, flakes, rude pottery, bones of the pig, dog, horse, sheep, and goat, with those of many wild animals still indigenous in Europe, and of some that are extinct, and many human skeletons. The latter show that the people populated the caves in great numbers. They were a race of short-statured people having common resemblances in various regions of Europe. They were in some regions cannibals, and slightly in advance of the Paleolithic races in the variety of their implements and occupations. Their gradual progress down to the dawn of history is shown by the substitution of bronze, and then of iron, in place of the stone of earlier ages for implements and weapons.

In America, caves with human remains have been investigated in Brazil, Ohio, Kentucky, Minnesota, Arizona, Colorado, Nevada, Utah, and California. There are remains that have been deposited within the period of authentic history. The conclusions drawn from cave remains, as to the antiquity of man, are subject to the doubts that beset all calculations as to the rate of deposit of geological strata and to the rapidity of changes in climates and zoölogical characteristics.

CAVELL, EDITH, an English nurse, born at Norwich, England, in 1872. Her father was a clergyman. She was trained as a nurse in a London hospital, entering the institution in 1896. In 1900 she went to Belgium for the purpose of organizing and carrying on a training school for Belgian nurses. She showed remarkable administrative ability, and in 1906 the institution of which she had become the head was the most important of its kind in Belgium. When the World War broke out she was on a visit to England, but at once returned and threw all her energies into the work of nursing wound-

ed soldiers. At first there was no obstacle put in her way by the German authorities, for German soldiers as well as French, Belgian, and English were nursed without discrimination. The Dutch frontier was not far away and a secret service was organized by the Allies and their sympathizers to enable wounded English soldiers, as soon as they had sufficiently recovered, to get across the border into Holland and ultimately be transferred to their own country. Miss Cavell was intensely patriotic and aided in this work, as she freely admitted, when later on she was brought to trial. In an organization so extensive it was almost a foregone conclusion that sooner or later some traitor would reveal its ramifications. This occurred in the case of Miss Cavell, who was denounced as participating in this plan of escape and arrested by the German authorities Aug. 5, 1915. She was confined in the prison of St. Gilles, was not allowed to communicate with her friends, and it was three weeks before the fact of her arrest was made known. The British Government at once took steps in her behalf to see that she should have a fair trial, and communicated with the American Minister at Brussels, Mr. Brand Whitlock. He took up the matter at once and communicated with Baron von Lancken, the chief of the political department of the German military government in Belgium. The inquiry was made August 31, but no reply was vouchsafed, and after a delay of ten days, Mr. Whitlock wrote again, and at last was informed on September 12 that a Belgian advocate had charge of Miss Cavell's case and that no interview with the prisoner would be permitted. Further attempts on the part of the American Legation were also fruitless. On October 4 Mr. Whitlock was informed that the trial was to take place on the 7th. On the 8th the trial was concluded and judgment reserved. After the trial was concluded Miss Cavell was taken back to prison. Her friends sought in vain to find out what sentence had been passed and when it was to be carried out. They were either denied information or put off with falsehoods. The adviser of the American Legation, Mr. Leval, and Minister Whitlock himself strove with all their power to get information in order that they might, if possible, avert the doom that they feared was impending. They prepared pleas for pardon, that were to be presented to the authorities in case Miss Cavell should receive the death sentence. All their efforts came up against the blank wall of official indifference or pretended ignorance.

On October 11 Miss Cavell was told that the death sentence had been passed upon her and that she would be shot the next morning. Two hours later the American officials were being positively assured by German officials that no judgment had been passed. At 6 o'clock news was brought to the American Legation by some of Miss Cavell's friends that she had been sentenced. Mr. Whitlock was ill and could not leave the house, but he set all his secretaries to work and himself dictated another note to Von Lancken. At the same time he instructed his aids to seek out the Spanish Minister, Villalobar, and go at once to Von Lancken's house to seek a commutation of the sentence. The Americans pleaded with him, and Villalobar added his entreaties. To all their appeals Von Lancken was adamant. She had been sentenced. She must die. The Kaiser himself could not help her. The next morning early Miss Cavell was shot. She met her fate with fortitude and without the slightest sign of fear. On May 15, 1919, her body, which had been exhumed at Brussels, was taken to Westminster Abbey, where an impressive service was held. All London turned out to do homage to her memory. Flags were flown at half-mast. The body was borne on a gun carriage, covered with flowers and the national flag and escorted by a regiment of the Guards, while hundreds of thousands of spectators with bared heads lined the streets through which the cortège passed. After the ceremony the body was taken to Norwich, her native town, where the burial took place.

CAVENDISH, WILLIAM, Duke of Newcastle; born in 1592. Son of Sir Charles Cavendish, he was made Earl of Newcastle by Charles I. On the approach of hostilities between the crown and Parliament he embraced the royal cause, and was invested with a commission constituting him general of all his majesty's forces raised N. of the Trent, with very ample powers. Through great exertions and the expenditure of large sums from his private fortune he levied a considerable army, with which, for some time, he maintained the King's cause in the N. When the royal cause became hopeless he retired to Holland. He returned after an absence of 18 years, and was rewarded for his services and sufferings with the dignity of duke. He was the author of several mediocre poems and plays, and a treatise on horsemanship. He died in 1676.

CAVENDISH, WILLIAM, first Duke of Devonshire, a British statesman and



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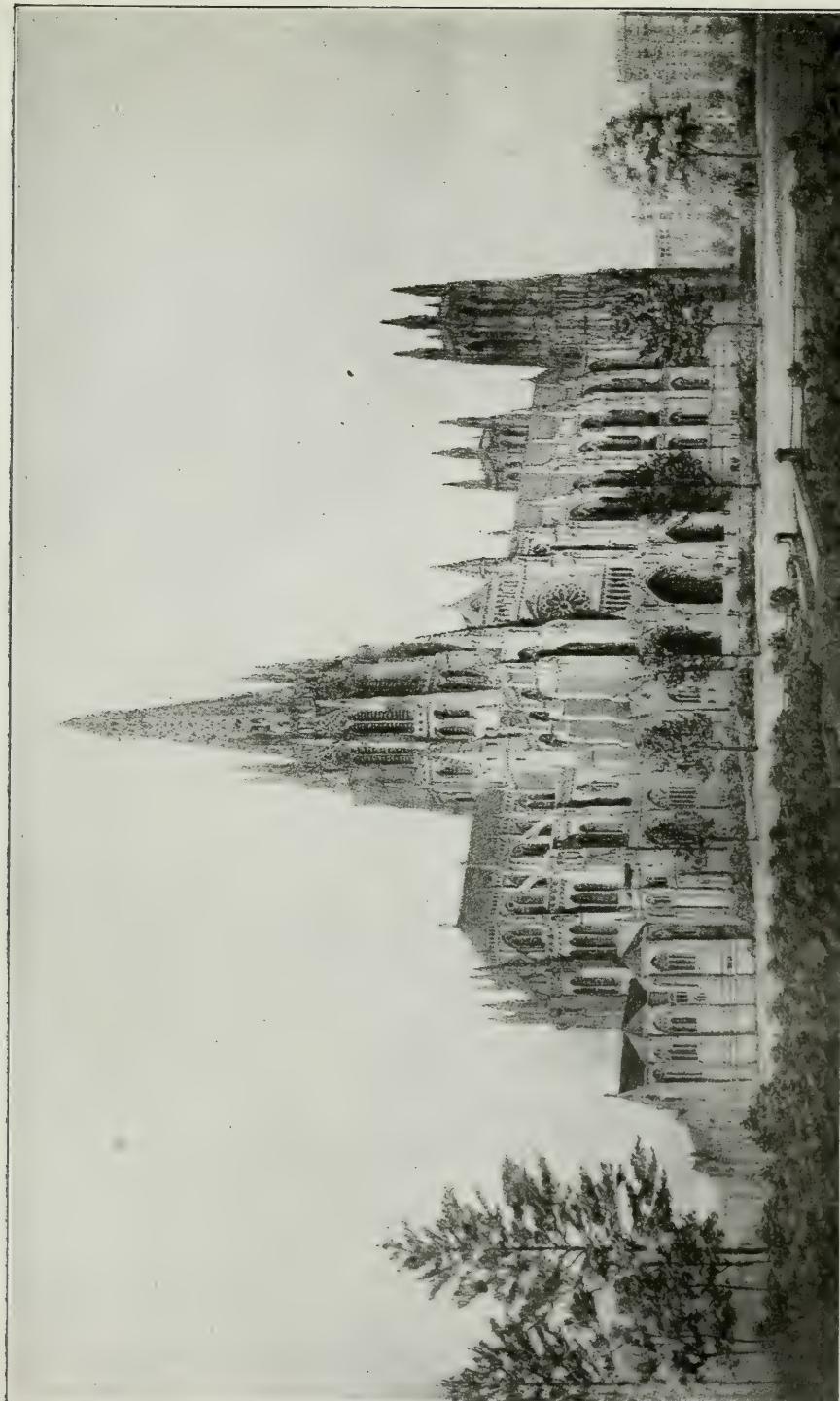
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ST. PAUL'S CATHEDRAL, LONDON

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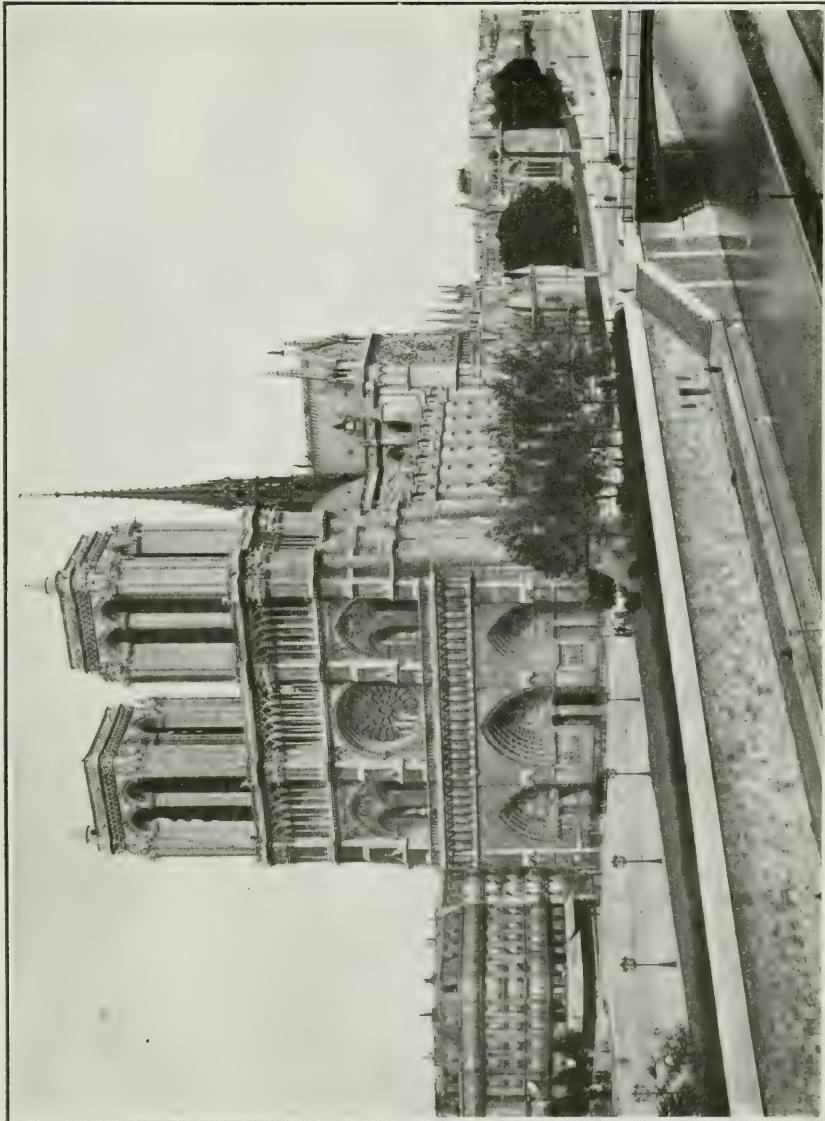


THE UNFINISHED PROTESTANT EPISCOPAL CATHEDRAL OF ST. JOHN THE DIVINE, NEW YORK



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ST. PATRICK'S CATHEDRAL, FIFTH AVENUE, NEW YORK



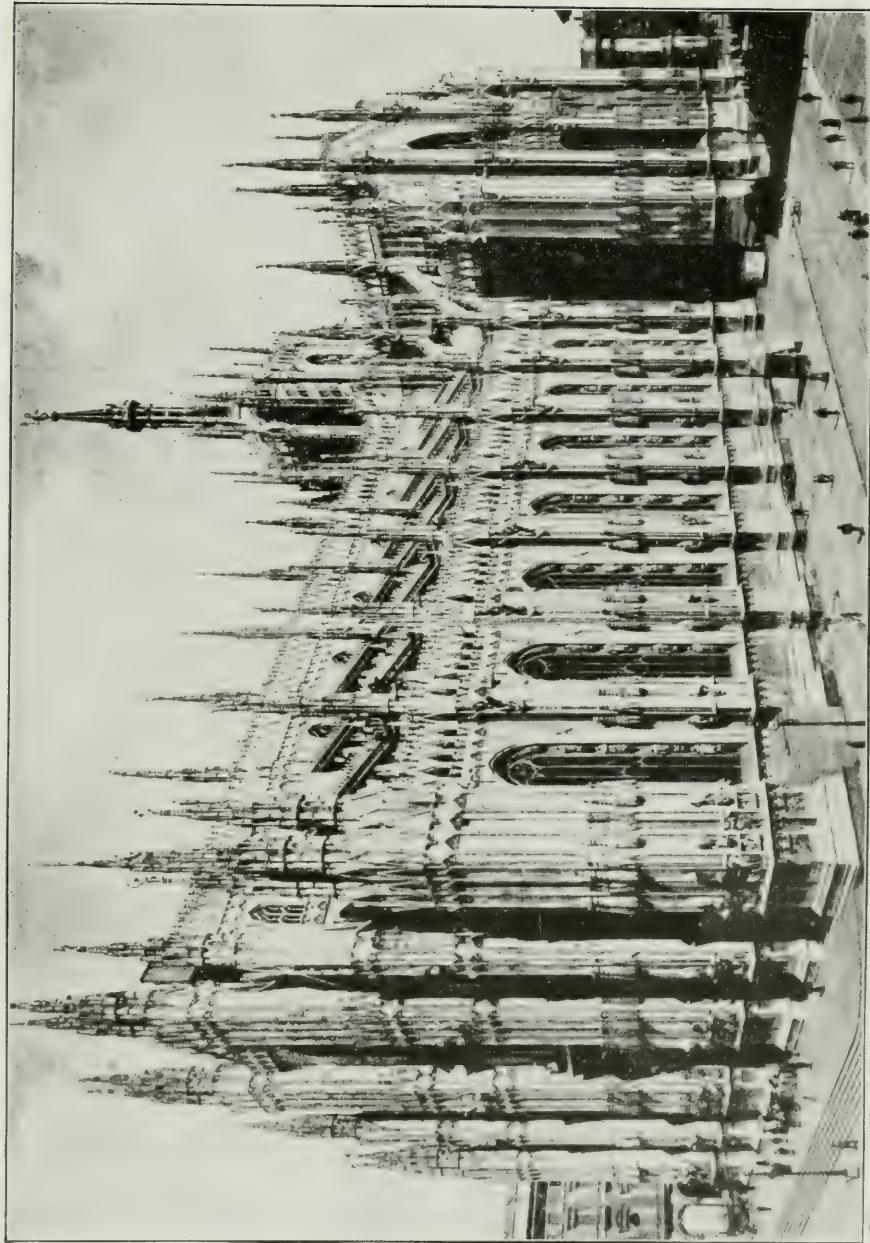
NOTRE DAME DE PARIS, THE FAMOUS CATHEDRAL SITUATED ON THE ILE DE LA CITE, PARIS

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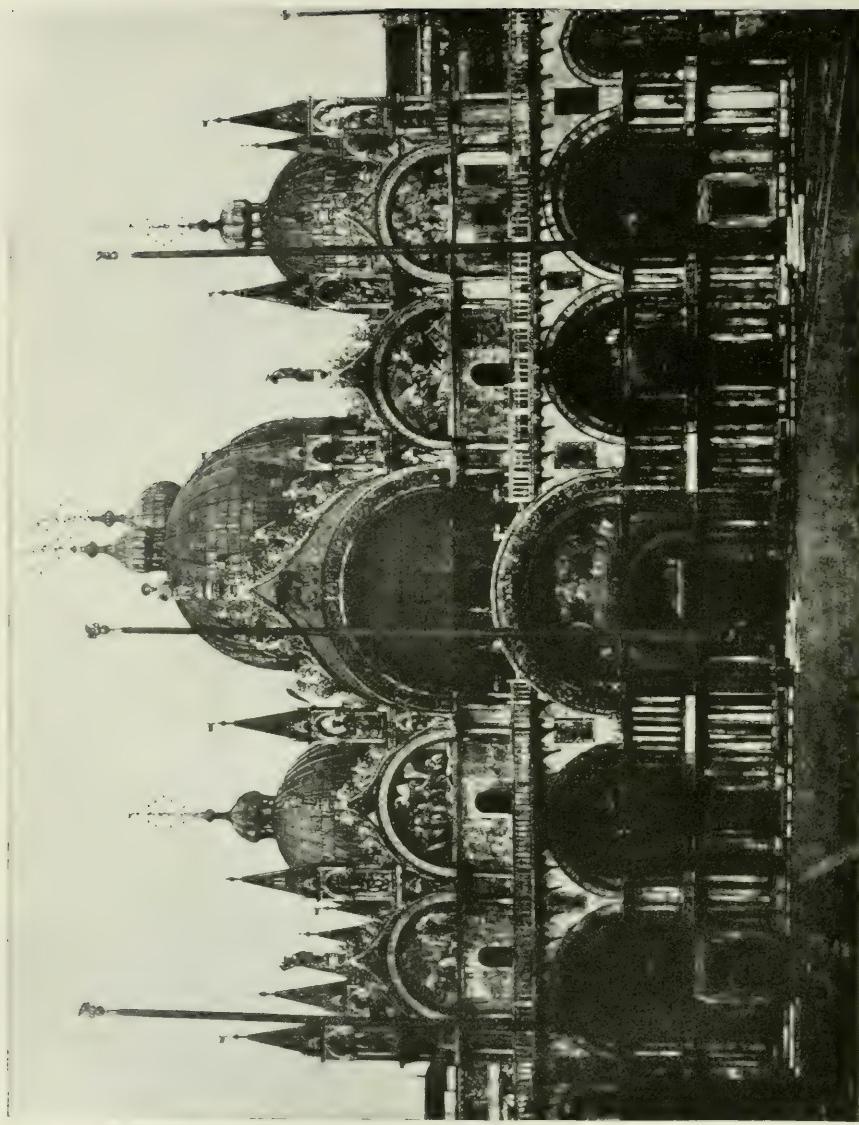
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THE CATHEDRAL AT TOLEDO, SPAIN



THE FAMOUS GOTHIC CATHEDRAL AT MILAN, ITALY

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ST. MARK'S CATHEDRAL, VENICE, ITALY

patriot; was born in 1640. On various occasions he distinguished himself by his spirit and valor, and in 1677 began that opposition to the arbitrary measures of the ministers of Charles II. which caused him to be regarded as one of the most determined friends of the liberties of his country. He took an active part in promoting the Revolution, and was one of the first who declared for the Prince of Orange. His services were rewarded with the dignity of duke. He died in 1707.

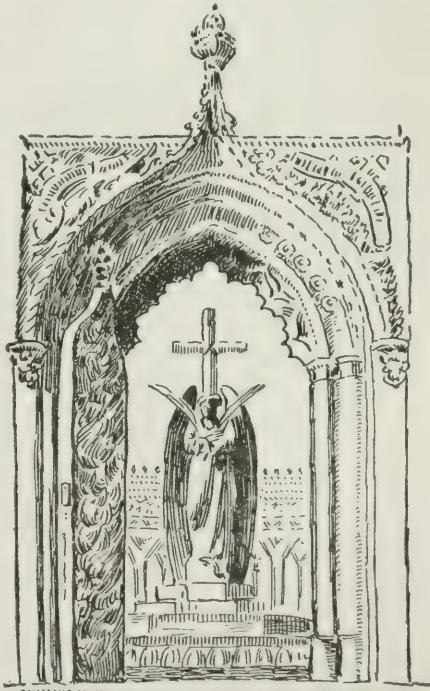
CAVITE (kä-vē-tā'), a small seaport of Luzon, Philippine Islands; about 11 miles S. W. of Manila and fronting directly on the bay; pop. about 5,000. The town dates almost from the first occupation of the Spaniards and was elaborately fortified with docks and arsenals in the 18th century. Subsequently these works were permitted to decay and Cavite became a place of minor importance. On May 1, 1898, Admiral Dewey won his great victory over Admiral Montojo, off Cavite. The town gives its name to a province; area, 610 square miles; pop. about 140,000. The principal crops are sugar, rice, and coffee.

CAVOUR, COUNT CAMILLO BENSO DI (kä-vör'), an Italian statesman, born in Turin, Aug. 10, 1810; was educated in the military academy at Turin, and after completing his studies he made a journey to England, where he remained for several years, making himself acquainted with the principles and working of the British constitution, and forming friendships with some of the most distinguished men. He became a member of the Sardinian Chamber of Deputies in 1849, and the following year minister of commerce and agriculture. In 1852 he became premier, and not long afterward took an active part in cementing an alliance with Great Britain and France, and making common cause with these powers against Russia during the Crimean War. The attitude, however, thus taken by Sardinia could not fail to prove offensive to Austria. A collision, therefore, was inevitable, resulting in the campaign of 1859. The intimate connection formed at that time with France, who lent her powerful assistance in the prosecution of the war, was mainly due to the agency of Cavour, who was accused by some on this occasion of having purchased the assistance of Napoleon III. by unduly countenancing his ambitious projects. In 1860 Garibaldi's expedition to Sicily took place; but toward this and the subsequent movements of the Italian liberator Count Cavour was forced to maintain an apparent coldness. He lived to see the meeting of

the first Italian Parliament, which decreed Victor Emmanuel king of Italy. He died June 6, 1861.

CAWDOR, a village in Nairnshire, Scotland, 5½ miles S. W. of Nairn. Cawdor Castle, near by, the seat of the Earl of Cawdor, was founded in 1454, but is one of the three places which tradition has assigned as the scene of King Duncan's murder by Macbeth in 1040. Pop. about 900.

CAWNPUR (ör), or **CAWNPORE**, a town, India, capital of a district of the same name in the Allahabad division of the United Provinces, on the right bank of the Ganges, which is here about a mile wide, 130 miles N. W. from Allahabad, 628 miles N. W. of Calcutta, and 266 miles S. E. of Delhi. It is a modern town with nothing specially noteworthy about it as regards site or buildings. It has manufactures of leather, cotton goods, etc., and a large trade. Pop. about 180,000. Area of district, 12,384 square miles; pop. about 1,200,000.



MONUMENT AT MEMORIAL WELL,
CAWNPUR

In 1857 the native regiments stationed here mutinied and marched off, placing themselves under the command of the Rajah of Bithoor, the notorious Nana Sahib. General Wheeler, the com-

mander of the European forces, defended his position for some days with great gallantry, but, pressed by famine and loss of men, was at length induced to surrender to the rebels on condition of his party being allowed to quit the place uninjured. This was agreed to; but after the European troops, with the women and children, had been embarked in boats on the Ganges, they were treacherously fired on by the rebels; many were killed, and the remainder conveyed back to the city, where the men were massacred and the women and children placed in confinement. The approach of General Havelock to Cawnpur roused the brutal instincts of the Nana, and he ordered his hapless prisoners to be slaughtered, and their bodies to be thrown into a well. The following day he was obliged, by the victorious progress of Havelock, to retreat to Bithoor. A memorial has since been erected over the scene of his atrocities, and fine public gardens now surround the well.

CAXAMARCA, or **CAJAMARCA** (kä-hä-mär'kä), a department and town of Peru; area of the department 12,538 square miles; pop. about 443,000. The town is situated about 70 miles from the Pacific Ocean, 280 N. of Lima. Pop. about 10,000. It was the scene of the imprisonment and murder of Atahualpa, the last of the Incas.

CAXTON, WILLIAM, an English printer and scholar, born in the Weald of Kent, about 1422. His "Recuyell (collection) of the Histories of Troy," translated by him from the French, appears to have been printed in 1474. It was the first book in English reproduced by typography. He set up a printing-office in Westminster, 1477; and on Nov. 18 of that year issued "The Dictes and Sayings of the Philosophers," folio, a work ever memorable as the first book printed in England. He printed in all 99 separate works, very many of them translated by him from the French; his translations even of Latin classic authors were made, not directly from the original language, but from French versions. He died in 1491.

CAYENNE (ki-yen'), a fortified seaport, capital of French Guiana, on an island at the mouth of a river of the same name. A new town is connected with the older portion by the Place d'Armes, bordered with orange trees. The harbor is the best on the coast, but insecure and shallow. Cayenne is the entrepôt of all the trade of the colony and was formerly chiefly known as a great French penal settlement. The climate is extremely unwholesome for Eu-

ropeans. The French took possession of the island in 1604, and again, after it had been held by the English and Dutch, in 1677. Pop. about 14,000.

CAYENNE PEPPER. See CAPSICUM.

CAYES, or **AUX CAYES** (ki), a seaport of Haiti, on the S. W. coast, 95 miles W. S. W. of Port-au-Prince. Pop. about 15,000.

CAYMAN ISLANDS, three islands situated about 140 miles N. W. of Jamaica, of which they are dependencies. Grand Cayman, the largest and the only one inhabited, is 17 miles long and from 4 to 7 broad, and has two towns or villages. The inhabitants, about 6,000 in number, partly descendants of the buccaneers, are chiefly employed in catching turtle. The other two islands are Little Cayman and Cayman Brac. Total area, 225 square miles.

CAYUGA LAKE, a lake of Central New York, noted for the picturesque scenery of its surroundings. It is a resort for tourists, navigable for small vessels; 38 miles long.

CEARÁ (thä-ä-rä'), a state of Brazil, on the N. coast, with an area of 40,253 square miles, and about 1,500,000 inhabitants. The interior presents a succession of wooded hills and wide plateaus; cattle-raising is an important industry; cotton, coffee, and sugar are largely grown; and iron and gold are found. The capital, Ceará, or Fortaleza, had formerly only an open roadstead, but extensive harbor improvements, with breakwater and viaduct, have been provided. It is the terminus of a railway to Baturité and has a large trade. Pop. about 50,000.

CEBU (thä-bö), one of the Philippine Islands, between Luzon and Mindanao, 135 miles long, with an extreme width of 30 miles. The chief products are sugar, hemp, tobacco, cotton, and rice. Area, 1,782 square miles. Pop. about 650,000. The town of Cebu, on the E. coast of the island, the oldest Spanish settlement in the Philippines, is a place of considerable trade, and has a cathedral and several churches. It is about 360 miles from Manila and has a population of about 46,000. There are valuable and extensive coal deposits near the town.

CEBUS, a genus of American monkeys, characterized by a round head and short muzzle, a facial angle of about 60°, long thumbs, and a long, prehensile tail, entirely covered with hair. The species are numerous, all of a very lively disposition and gregarious habits, living in trees. They feed chiefly on fruits, but also on

insects, worms, and mollusks. They are included under the popular designation of Sapajou in its wider sense, and some of them are the monkeys to which this name is sometimes more strictly appropriated. *C. fatuellus*, which ranges from Paraguay to Guiana, and *C. capucinus*, Guiana, Venezuela, and Peru, are common in menageries.

CECIDOMYIA, a genus of two-winged flies *Diptera*, of the family *Tipulidae*. There are about 26 species, all of which are of small size. *C. tritici*, the Wheat-fly, is well known from its attacks on wheat.

CECIL, LORD ROBERT, a British statesman; born Sept. 14, 1864. He was the third son of the Marquis of Salisbury and chose a diplomatic career, after having been educated at Eton and University College, Oxford. He was a member of Parliament from East Marylebone, 1906-1910; occupied various im-



LORD ROBERT CECIL

portant Cabinet positions during the World War and was an influential figure throughout the conflict. In 1915-1916 he was Parliamentary Under-Secretary for Foreign Affairs; was made Minister of Blockade in 1916 and Assistant Secretary of State for Foreign Affairs in

1916. At the Peace Conference in Paris, he was one of the British delegates, and was especially prominent in preparing the draft of the League of Nations, of which he was an ardent advocate. He was an able speaker and a successful executive and administrator.

CECIL, ROBERT (ses'il), Earl of Salisbury, an English statesman, second son of William Cecil, Lord Burleigh, born about 1563. He was of a weak constitution, on which account he was educated at home till his removal to the University of Cambridge. Having received the honor of knighthood he went to France as assistant to the English ambassador. On the death of Sir Francis Walsingham he succeeded him as principal secretary, and continued to be a confidential minister of Queen Elizabeth to the end of her reign. Having secretly supported the interests of James I. previous to his accession to the crown, he was continued in office under the new sovereign and raised to the peerage. In 1603 he was created a baron, in 1604 Viscount Cranbourn, and in 1605 Earl of Salisbury. In 1608 Lord Salisbury was made Lord High-Treasurer, an office which he held till his death, in 1612.

CECIL, WILLIAM, LORD BURLEIGH. See BURLEIGH.

CECILIA, ST., the patroness of musicians, who suffered martyrdom 230 A. D. Her heathen parents, as we are told, belonged to a noble Roman family, and betrothed their daughter, who had been converted to Christianity, to a heathen youth, named Valerian. This youth and his brother Tiberius became Christian converts, and suffered martyrdom. Cecilia, when commanded to sacrifice to idols, firmly refused, and was condemned to death. Her persecutors, it is said, first threw her into a boiling bath, but on the following day they found her un-hurt. The executioner next attempted to cut off her head, but found it impossible. She died three days after. As early as the 5th century, there is mention of a church dedicated to her at Rome; and in 821, by order of Pope Pascal, her bones were deposited there. St. Cecilia is regarded as the inventor of the organ, and in the Roman Catholic Church her festival-day, Nov. 22, is celebrated with splendid music. Chaucer, Dryden, Pope, and other poets have celebrated St. Cecilia, and the painters Raphael, Domenichino, Dolce, and others have represented her in fine pictures.

CEDAR FALLS, a city of Black Hawk co., Ia., 85 miles N. E. of Des Moines. It is on the Illinois Central and other railroads. It has mills and factories

for oatmeal, flour, wagons, pumps, harvesters, brooms and other products. It is the seat of the Iowa State Teachers College. Its water works and electric lighting plant are municipally owned, and it has a hospital, excellent schools and a Carnegie library. It was settled in 1845 and received its civic charter in 1865. Pop. (1910) 5,012; (1920) 6,316.

CEDAR MOUNTAIN, an elevation in Culpeper co., Va., where in the American Civil War, on Aug. 9, 1862, Gen. Banks was defeated by a superior Confederate force under Gen. Jackson, and retired for re-enforcements from Gen. Pope, with a loss of 1,400 killed and wounded, 400 prisoners, and many missing. The Confederates, who held the field two days and then fell back to meet Lee at Gordonsville, lost 1,314.

CEDAR RAPIDS, a city in Linn co., Ia., on the Cedar river, and on the Chicago and Northwestern, the Chicago, Milwaukee and St. Paul, the Illinois Central and other railroads; 79 miles S. W. of Dubuque. The city is regularly laid out and well built, and is the trade center of the surrounding country. It contains large pork-packing establishments, and the river supplies power for numerous manufactories and machine shops. The headquarters of the Order of Railway Conductors are located here. It is the seat of Coe College, and has electric lights and railways, waterworks, a high school, several churches, daily and weekly newspapers, public and Masonic libraries, National banks, St. Luke's Hospital, etc. The city is connected with the opposite bank of the river by several bridges. Pop. (1910) 32,811; (1920) 45,566.

CEFALU, an episcopal city and seaport in the province of Palermo, Sicily, 40 miles E. S. E. of the city of Palermo. It has a fine cathedral, several churches, and while the harbor is small it has considerable importance as a seaport. Its inhabitants are chiefly engaged in fishing and quarrying. Pop. about 15,000.

CELAYA, a town in the Mexican State of Guanajuato, on the Rio Laja, about 150 miles N. W. of the city of Mexico; has several fine plazas, handsome churches, and manufactures of cotton and woolen cloths and saddlery. Pop. about 25,000.

CELEBES (sel'eb-ēz), one of the larger islands of the Indian Archipelago, between Borneo on the W. and the Moluccas on the E. It consists mainly of four large peninsulas stretching to the E. and S., and separated by three deep gulfs; total area, 72,070 square miles. No part of it is more than 70 miles from

the sea. Celebes is mountainous chiefly in the center and the N., where there are several active volcanoes. It has also broad grassy plains and extensive forests. Gold is found in all the valleys of the N. peninsula, which abounds in sulphur. Copper occurs at various points, and in Macassar tin also. Diamonds and other precious stones are found. The island is entirely destitute of feline or canine animals, insectivora, the elephant, rhinoceros, and tapir (though these are found in Borneo), but it has the antelopean buffalo (*Anoa*), the spiral-tusked pig (*Babyroussa*), etc. Among domesticated animals are small but vigorous horses, buffaloes, goats, sheep, and pigs. Trepang and turtle are caught in abundance. Marsupial animals are represented by the cuscus, an opossum-like animal with a prehensile tail. Among the trees are the oak, teak, cedar, upas, bamboo, etc. Among cultivated plants are the coffee-tree, indigo, cacao, sugar-cane, manioc root, tobacco, etc.

The maritime districts are inhabited by Malays; the Peninsula of Macassar is occupied by Bugis and Macassars. Mandhars dwell in the W. of the island, and the mountainous regions in the interior, especially in the N., are inhabited by Alfoories. The inhabitants may be classed into two groups: the Mohammedan semi-civilized tribes, and the pagans, who are more or less savage. The capital is Macassar, in the S. W. of the island (pop. about 30,000). The trade in trepang is very important, Macassar being the chief staple place for this article of commerce. The three great languages of the island, not reckoning the dialects of the savage tribes, are those of the Bugis, the Macassars, and the Mandhars. The ancient Bugi is the language of science and religion. The Bugis have a considerable body of literature. Celebes was first visited by the Portuguese in 1512, but no factory was established by them there till a few years later. In 1660 Macassar was taken by the Dutch, the southern portion of the island put under Dutch rule, and the Portuguese expelled. In 1683 the northern part likewise fell into their hands. The island was conquered by the British in 1811, but a few years later it was again given up to the Dutch, in whose possession it has remained ever since. Pop. about 3,100,000.

CELERIAC, turnip-rooted celery, a variety of celery in which the root resembles a turnip and may weigh 3 or 4 pounds. It is not earthed up, but is grown upon the surface of the ground, and kept free from weeds by frequent hoeing.

CELERY, the common English name of *Apium graveolens*, a species of parsley. The blanched leaf-stalk of the cultivated varieties is used extensively for salads, etc. In its native state the seeds and whole plant are acrid and poisonous, and over-indulgence in the cultivated plant is said to induce urinary disorders.

CELESTINE I., or **CELESTINUS**, a Pope and saint, succeeded Boniface I. in 422. He was engaged in disputes with the Nestorians at the instigation of Cyril, bishop of Alexandria, and condemned them in a council held at Rome 430. Died 432, and was succeeded by Sixtus III.

CELESTINE II., a Tuscan, succeeded Innocent II., and died five months after, 1142.

CELESTINE III., succeeded Clement III. in 1191, crowned the Emperor Henry VI., excommunicated Leopold, Duke of Austria, and died 1198.

CELESTINE IV., a Milanese, succeeded Gregory IX. in 1241, and died about three weeks after his election.

CELESTINE V. (Pietro di Monrone), a Benedictine monk, who founded the order of the Celestines. He was elected Pope in 1294, after an interregnum of six years. A few months after, he resigned his office and was succeeded by Boniface VIII., who confined him in the castle of Fumone, where he died. He was canonized in 1313 by Clement V.

CELIBACY, the state of being celibate or unmarried; specially applied to the voluntary life of abstinence from marriage followed by many religious devotees and by some orders of clergy, as those of the Roman Catholic Church. The ancient Egyptian priests preserved a rigid chastity; the priestesses of ancient Greece and Rome were pledged to perpetual virginity, and celibacy is the rule with the Buddhist priests of the East. Among Christians the earliest aspirants to the spiritual perfection supposed to be attainable through celibacy were not ecclesiastics as such, but hermits and anchorites who aimed at superior sanctity. During the first three centuries the marriage of the clergy was freely permitted, but by the Council of Elvira (305) continence was enjoined on all who served at the altar. For centuries this subject led to many struggles in the church, but was finally settled by Gregory VII. positively forbidding the marriage of the clergy. The Council of Trent (1593) confirmed this rule. In the Greek Church celibacy is not compulsory on the ordinary clergy. Protestants hold that there is no moral superiority in celibacy over

marriage, and that the church has no right to impose such an obligation on any class of her ministers.

CELL, a term of various applications: (1) the compartments of a honey-comb, (2) one of the small structures composing the substance of plants, generally indistinguishable by the naked eye, and each, at least for a time, being a whole complete in itself, being composed of solid, soft, and fluid layers, different in their chemical nature, and disposed concentrically from without inward. For the most part, a group of them is in close contact, and firmly united; they then form a cell-tissue. Each cell fulfills its own definite part in the economy of the plant, and shows a variety in form corresponding to the different functions. By far the largest proportion of cells in the living succulent parts of plants are seen to be made up of three concentrically-disposed layers: first, an outer skin, firm and elastic, called the cell-wall or cell-membrane, consisting of a substance peculiar to itself. The second layer is soft and elastic, and always contains albuminous matter. And, thirdly, the cavity inclosed by the protoplasm-sac is filled with a watery fluid called cell-sap.

(3) A term often applied to any small cavity, but properly restricted to a microscopical anatomical element with a nucleus cell-wall and cell-contents when typically formed. The animal cell is ordinarily a closed sac, the environing membrane almost always consisting of a nitrogenous compound. The sac generally contains a liquid or semi-liquid protoplasm, in which are suspended molecules, granules, globules, or other very minute cells. Along with these are nuclei, which again contain nucleoli. Cells may be formed from a protoplasm existing without the cell or within other cells. Or they may be made within others by what has hence been called an endogenous method or by division or in other ways.

(4) The space between the two ribs of a vault, or the space inclosed within the walls of an ancient temple.

(5) A structure in a wrought-iron beam or girder; a tube consisting of four wrought-iron plates riveted to angle-iron at the corners.

(6) In electricity, a single jar, bath, or division of a compound containing a couple of plates, e. g., copper and zinc, united to their opposite or to each other usually by a wire.

CELLERE, B. MACCHI DI, an Italian diplomat, born 1866. For many years he had minor secretarial offices in the Department of Foreign Affairs, and was made chargé d'affaires at Washing-

ton in 1904. From 1907 to 1912 he was Minister to Argentina. In 1913 he became Italian Ambassador to the United States, an office which he held till his sudden death following an operation, Oct. 20, 1919.

CELLINI, BENVENUTO (*chel-lé'nē*), a Florentine sculptor, engraver, and goldsmith, born in 1500. Of a bold, honest, and open character, but vain and quarrelsome, he was often entangled in disputes which frequently cost his antagonists their lives. At the siege of Rome (if we believe his own account, given in his autobiography) he killed the Constable of Bourbon and the Prince of Orange. He was afterward imprisoned on the charge (probably false) of having stolen the jewels of the Papal crown, and with difficulty escaped exe-

horts, clasps, medals, and coins. The second includes his larger works as a sculptor, such as the Perseus mentioned above; a colossal Mars for a fountain at Fontainebleau; a marble Christ in the Escorial Palace; a life-size statue of Jupiter in silver, etc. His life, written by himself, is very racy and animated. He died in Florence in 1571.

CELLULOID, an ivory-like compound, which can be molded, turned, or otherwise manufactured for various purposes for which, before its introduction, ivory and bone were employed. The process of manufacture is as follows: Paper, by immersion in sulphuric and nitric acids, is converted into nitrocellulose. This product, after washing and bleaching, is passed through a roller-mill, with the addition of a certain quantity of camphor. Celluloid softens at 176° F., when it can be molded into the most delicate forms, to become hard when cold. It is very inflammable, unless blended with some chemical having an opposite property. The word celluloid as applied in the United States to this compound is a legally registered trademark.

CELLULOSE. $C_6H_{10}O_6$. A carbohydrate which forms the main constituent of all vegetable tissues. It is the basis of our textile and paper-making industries, and forms the raw material for artificial silk, nitrocellulose (gun-cotton) and celluloid. It may be prepared in a pure state by repeated treatment of a vegetable substance such as cotton or wood, first with alkaline solvents and then with weak oxidizing agents, such as calcium hypochlorite solution or potassium permanganate solution. In this manner, other constituents of the vegetable tissue are removed, leaving the more resistant cellulose as a residue. The purest commonly-occurring form of cellulose is bleached cotton. It is insoluble in all common solvents, but dissolves in a concentrated solution of zinc chloride and in a solvent prepared by dissolving copper hydrate in ammonium hydroxide. These solutions of cellulose have a number of commercial applications, the most important being the preparation of carbon filaments for electric lamps, and the manufacture of artificial silk and of the so-called "Willesden" waterproof fabrics. On treatment with strong alkaline hydroxide solutions, cellulose acquires a luster and becomes silky to the touch. This reaction is the basis of the mercerized cotton industry. On fusing cellulose with caustic alkalies at high temperatures it is resolved into oxalic and acetic acids, and, on dry distilling, charcoal, acetic acid, wood alco-



BENVENUTO CELLINI

cution. He then visited the court of Francis I. of France. He afterward returned to Florence, and under the patronage of Cosmo de' Medici made a Perseus with the head of Medusa in bronze, which is still an ornament of one of the public squares; also a statue of Christ, in the chapel of the Pitti Palace, besides many excellent dies for coins and medals. His works may be divided into two classes. The first, for which he is most celebrated, comprises his smaller productions in metal, the embossed decorations of shields, cups, salvers, ornamented sword and dagger

hol, acetone and other compounds are produced. See also NITRO-CELLULOSE.

CELSIUS SCALE, another name for the Centigrade thermometric scale, from that of the inventor, Anders Celsius. See THERMOMETER.

CELT, the earliest Aryan settlers in Europe according to the common theory. They appear to have been driven westward by succeeding waves of Teutons, Slavonians, and others, but there are no means of fixing the periods at which any of these movements took place. Herodotus mentions them as mixing with the Iberians who dwelt round the river Ebro in Spain. At the beginning of the historic period they were the predominant race in Great Britain, Ireland, France, Belgium, Switzerland, northern Italy, Spain, and elsewhere. The Romans called them generally Galli, that is, Gauls or Gael. They appear to have reached the zenith of their power in the 2d and 3d centuries B. C. Some tribes of them, overrunning Greece, settled in a part of Asia Minor, to which the name of Galatia was given. They finally went down before the resistless power of Rome, and either became absorbed with the conquering races or were cooped up in the extreme N. W. of Europe. At an early date the Celts divided into two great branches, speaking dialects widely differing from each other, but doubtless belonging to the same stock. One of these branches is the Gadhelic or Gaelic, represented by the Highlanders of Scotland, the Celtic Irish, and the Manx; the other is the Cymric, represented by the Welsh, the inhabitants of Cornwall, and those of Brittany. The Cornish dialect is now extinct.

The sun seems to have been the principal object of worship among the Celts, and groves of oak and the remarkable circles of stone commonly called "Druidical Circles," their temples of worship. All the old Celts seem to have possessed a kind of literary order called Bards. The ancient Irish wrote in a rude alphabet called the Ogham; later they employed the Roman alphabet, or the Anglo-Saxon form of it. The chief literature existing consists of the hymns, martyrologies, annals, and laws of Ireland, written from the 9th to the 16th centuries. The Scottish Gaelic literature extant includes a collection of manuscripts in the Advocates' Library, Edinburgh, some of which date from the 12th century; the "Book of the Dean of Lismore," 16th century; a number of songs from the 17th century to the present day; and the so-called poems of Ossian. The Welsh literary remains date from

the 9th century, and consist of glossaries, grammars, annals, genealogies, histories, poems, prose tales, etc.

CEMENT, a substance with which two bodies are joined together. There are many varieties, according to the special needs of different trades. In building the principal are known as Portland and Roman. There are many places in the United States in which are found the ingredients necessary for the manufacture of the various cements described below, and many different varieties of the article are made. Where Portland cement is specified in a building contract the imported variety is meant.

Portland Cement was patented in England by Joseph Aspdin in 1824. It is so called because it resembles in color Portland-stone. It is manufactured by calcining a mixture of clayed mud from the Thames with a proper portion of chalk. The calcined mass is then reduced to a fine powder, and intimately mixed with the addition of water. The resulting paste is molded into bricks, dried and burnt. The heat during the process of calcining must be a white heat, otherwise the carbonic acid and water may be expelled without the reaction between the lime and the clay necessary for the production of cement. The material is then assorted, all which has been too much or too little calcined being set aside and pulverized.

Roman Cement is a name given to certain hydraulic mortars, varying considerably in their chemical composition, though physically possessing the same general character. Limestone is calcined and mixed with sand in various proportions. Any limestone containing from 15 to 20 per cent. of clay will, when properly prepared, form this cement. Calcine any ordinary clay and mix it with two-thirds its quantity of lime, grind to powder, and calcine again. The epithet Roman is improperly given, since the preparation was entirely unknown to the Romans.

Hydraulic Cement is a kind of mortar used in building piers and walls under or exposed to water. There are many varieties, one of the best being composed of ground Portland-stone, 62 parts; sand, 35, and litharge, 3.

The production of cement in the United States in 1919 was: Portland, 80,287,000 barrels, valued at \$135,-685,000; natural Cement, 528,000 barrels, valued at \$597,000. Pennsylvania ranks first in the production of Portland Cement, with 25,222,000 barrels in 1919.

CENCI, BEATRICE (*chen'chē*), called the beautiful parricide, the daughter of

Francesco Cenci, a noble and wealthy Roman, who, according to the common story, after his second marriage, behaved toward the children of his first marriage in the most shocking manner, procured the assassination of two of his sons, on their return from Spain, and debauched his youngest daughter Beatrice. She failed in an appeal for protection to the Pope, and planned and executed the murder of her father. She was beheaded in 1599 and the Cenci estates confiscated. She is the alleged subject of an admired painting by Guido, and is the heroine of one of Shelley's most powerful plays. Recent researches have deprived the story of most of its romantic elements, and have shown Beatrice to be a very commonplace criminal, whatever the evil deeds of her father may have been. Her stepmother and brother, who were equally guilty with her, were also executed. The portrait by Guido is now believed not to represent her at all.

CENIS, MONT (se-nē'), a mountain belonging to the Graian Alps, between Savoy and Piedmont, 11,755 feet high. It is famous for the winding road constructed by Napoleon I., which leads over it from France to Italy, and for an immense railway tunnel, which, after nearly 14 years' labor, was finished in 1871. The tunnel does not actually pass through the mountain, but through the Col de Fréjus, about 15 miles to the S. W., where it was found possible to construct it at a lower level. The Mont Cenis Pass is 6,765 feet above the level of the sea, whereas the elevation of the entrance to the tunnel on the side of Savoy is only 3,801 feet, and that on the side of Piedmont 4,246 feet. The total length of the tunnel is 42,145 feet, or nearly 8 miles. The total cost amounted to about \$15,000,000, which was borne partly by the French and Italian governments and partly by the Northern Railway Co. of Italy. The tunnel superseded a grip railway way which was constructed over the mountain by Mr. Fell, an English engineer, 1864-1868.

CENOTAPH, an empty monument, that is, one raised to a person buried elsewhere.

CENOZOIC, a geological term applied to the latest of the three divisions into which strata have been arranged, with reference to the age of the fossils they include. The *Cenozoic* system embraces the tertiary and post-tertiary systems of British geologists, exhibiting recent forms of life, in contra-distinction to the *Mesozoic*, exhibiting intermediate, and the *Palæozoic*, ancient and extinct, forms,

It corresponds nearly with what has been called the age of mammals.

CENSUS, a periodical enumeration of the people of any State or country, with information regarding sex, age, family, occupation, possessions, religious beliefs, and other details. The original idea of counting the people was for the sake of obtaining the greatest number of men capable of bearing arms, and, secondly, of facilitating the raising of taxes. Such enumerations go back to a remote antiquity. Amasis in Egypt made a census 500 years before Christ. The first chapter of "Numbers" chronicles an enumeration of the Children of Israel for military purposes. King David numbered the people, and it is said that it was contrary to the will of the Lord, and consequently was punished by a plague which carried off 50,000 people (see Book of Kings). Solon at Athens established a census for the purpose of facilitating taxation and classifying the citizens. It is stated that after the time of Servius Tullius, or about 443 B. C., the census was taken every five years for military and tax purposes in Rome. The especial officers who served in this work were called censors. The property of the Roman citizens was registered by means of a census taken under Augustus. It is said that during the Middle Ages religious prejudices prevented the census from being taken, but various cities made attempts at different times to register the number of inhabitants. Thus Nuremberg held an enumeration in 1449 and Strasburg in 1475. Many of the details of these mediæval censuses are valuable as showing the property qualifications and other facts regarding life at this time. The ancient church books also contain interesting details regarding marriages, births, and deaths of citizens.

In the 18th century censuses began to be made in the more important countries of Europe. Thus in Sweden, in 1748, the first important enumeration of the people took place in 1749, and a special board for that purpose was called into life. Regular censuses were first established in the United States in 1790, in England and France in 1801, in Prussia in 1816, in Holland in 1819, in Sardinia in 1838, in Switzerland in 1841, and in Belgium in 1846. Censuses are now taken in Austria, Belgium, Italy, Norway, Sweden, Russia, Switzerland, the United States of America, India, and most of the British colonies, every ten years; in France and Germany, every five years; in Spain, at irregular intervals, the last having been in 1900. The International Statistical Congress, which

consists of eminent statisticians from all countries, has done much to improve the taking of censuses, and now several countries, such as Austria, Belgium, Italy, Prussia, Russia, and Switzerland, have statistical bureaus for the purpose, among other things, of controlling the taking of the periodical census. In the United Kingdom the practice is for Parliament to pass special acts directing the taking of each census.

The United States Census of 1910 had as its head Edward Dana Durand, who enlisted more than 71,400 employees. The local enumerators, on June 1, began to gather the required information by going through the country from house to house, and all the information was tabulated at Washington by more than 3,000 clerks.

In the enumeration of 1910 the territory of Hawaii and that of Porto Rico were included. It was required that the four principal reports, those on population, mortality, manufactures, and agriculture, should be published by July, 1912. The salaries of the 3,000 clerks amounted to nearly \$3,000,000 a year, and the pay of the enumerators was more than \$5,855,500, so that the total expenses of the Census of 1910 amounted to nearly \$15,000,000.

Census of 1920.—The Fourteenth Decennial Census was of the date of Jan. 1, 1920. It included in its scope (1st) population; (2d) agriculture, including drainage and irrigation; (3d) manufacturing; (4th) forestry and forest products; and (5th) mines, quarries, and oil and gas production. It is estimated that at least three years were required before all the subjects treated were completed. The cost of the census will be

approximately \$20,500,000. Over 90,000 enumerators, besides special agents, clerks, and supervisors, were employed. In 1925 a special census of manufactures will be taken and provision has been made for a biennial census of the products of manufacturing industries.

The population census of continental United States was completed on Oct. 7, 1920. The population of the United States, as a result of the census, was found to be 105,683,108, compared with 91,972,266 for 1910, and 75,994,575 for 1900. The percentage of increase in the decade was 14.0 per cent., compared with an increase in the previous decade of 21 per cent. The large falling off in the growth of the country as a whole as shown by these figures was due chiefly to an almost complete cessation of immigration for more than five years preceding the taking of the census in January, 1920. In some degree the result is also due to the epidemic of influenza in 1919 and to the casualties resulting from the World War.

The census indicated that the trend of the population from the country to the city had become greatly accentuated since 1910, and that for the first time in the history of the country more than one-half of the population in 1920 lived in urban territory as defined by the census bureau. 51.9 per cent. lived in incorporated places of 2,500 inhabitants and more, and 48.1 per cent. in rural territory. The urban population increased in the decade 28.6 per cent., and the rural population 3.1 per cent.

The following table gives the population of cities of 25,000 and over, according to the census of 1920:

Cities	Population		Per Cent. of Increase	
	1920	1910	1910-1920	1900-1910
Akron, O.	208,435	69,067	201.8	61.6
Alameda, Cal.	28,806	23,383	23.2	42.0
Albany, N. Y.	113,344	100,253	13.1	6.5
Allentown, Pa.	73,502	51,913	41.6	46.6
Altoona, Pa.	60,331	52,127	15.7	33.8
Amsterdam, N. Y.	33,524	31,267	7.2	49.4
Anderson, Ind.	29,767	22,476	32.4	11.4
Asheville, N. C.	28,504	18,762	51.9	27.7
Atlanta, Ga.	200,516	154,839	29.6	72.3
Atlantic City, N. J.	50,707	46,150	9.8	65.8
Auburn, N. Y.	36,192	34,668	4.4	14.2
Augusta, Ga.	52,548	41,040	28.0	4.1
Aurora, Ill.	36,397	29,807	22.1	23.4
Austin, Tex.	34,876	29,860	16.8	34.2
Baltimore, Md.	733,826	558,485	31.4	9.7
Bangor, Me.	25,978	24,803	4.7	13.5
Battle Creek, Mich.	36,164	25,267	43.1	36.1
Bay City, Mich.	47,554	45,166	5.3	63.5
Bayonne, N. J.	76,754	55,545	38.2	69.7
Beaumont, Tex.	40,422	20,640	95.8	118.9

Cities	Population 1920	Population 1910	Per Cent. of Increase 1910-1920	Per Cent. of Increase 1900-1910
Bellingham, Wash.	25,585	24,298	5.2	119.7
Berkeley, Cal.	56,036	40,434	38.2	206.0
Bethlehem, Pa.	50,358	12,837	292.3	19.3
Binghamton, N. Y.	66,800	48,443	37.9	22.2
Birmingham, Ala.	178,806	132,685	34.4	245.4
Bloomington, Ill.	28,725	25,768	11.5	10.7
Boston, Mass.	748,060	670,585	11.6	19.6
Bridgeport, Conn.	143,555	102,054	40.6	43.7
Brockton, Mass.	66,254	56,878	16.3	42.0
Brookline, Mass.	37,748	27,792	35.8	39.4
Buffalo, N. Y.	506,775	423,715	19.6	20.2
Butte, Mont.	41,611	39,165	6.2	28.5
Cambridge, Mass.	109,694	104,839	4.6	14.1
Camden, N. J.	116,309	94,538	23.0	24.5
Canton, O.	87,091	50,217	73.4	63.7
Cedar Rapids, Ia.	45,766	32,811	38.9	27.9
Charleston, S. C.	67,957	58,833	15.5	5.4
Charleston, W. Va.	39,608	22,996	72.2	107.2
Charlotte, N. C.	46,338	34,014	36.2	88.0
Chattanooga, Tenn.	57,895	44,604	29.8	47.9
Chelsea, Mass.	43,184	32,452	33.1	-4.8
Chester, Pa.	58,030	38,537	50.6	13.4
Chicago, Ill.	2,701,705	2,185,283	23.6	28.7
Chicopee, Mass.	36,214	25,401	42.6	32.5
Cicero (town), Ill.	44,995	14,557	209.1	-10.7
Cincinnati, O.	401,247	363,591	10.4	11.6
Clarksburg, W. Va.	27,869	9,201	202.9	127.2
Cleveland, O.	796,841	560,663	42.1	46.9
Clifton, N. J.	26,470	11,869	123.0	121.8
Colorado Springs, Col.	30,105	29,078	3.5	37.9
Columbia, S. C.	37,524	26,319	42.6	24.7
Columbus, Ga.	31,125	20,554	51.4	16.7
Columbus, O.	237,031	181,511	30.6	44.6
Council Bluffs, Ia.	36,162	29,292	23.5	13.5
Covington, Ky.	57,121	53,270	7.2	24.1
Cranston, R. I.	29,407	21,107	39.3	58.2
Cumberland, Md.	29,837	21,839	36.6	27.5
Dallas, Tex.	158,976	92,104	72.6	116.0
Danville, Ill.	33,776	27,871	21.1	70.4
Davenport, Ia.	56,727	43,028	31.8	22.1
Dayton, O.	152,559	116,577	30.9	36.6
Decatur, Ill.	43,818	31,140	40.7	50.0
Denver, Colo.	256,491	213,381	20.1	59.4
Des Moines, Ia.	126,468	86,368	46.4	39.0
Detroit, Mich.	993,678	465,766	113.4	63.0
Dubuque, Ia.	39,141	38,494	1.7	6.1
Duluth, Minn.	98,917	78,466	26.1	48.1
East Chicago, Ind.	35,967	19,098	88.3	459.9
East Cleveland, O.	27,292	9,179	197.3	232.9
Easton, Pa.	33,813	28,523	18.5	13.0
East Orange, N. J.	50,710	34,371	47.5	59.8
East St. Louis, Ill.	66,767	58,547	14.0	97.4
Elgin, Ill.	27,454	25,976	5.7	15.8
Elizabeth, N. J.	95,783	73,409	30.3	40.8
Elmira, N. Y.	45,393	37,176	21.9	4.2
El Paso, Tex.	77,560	39,279	97.4	146.9
Erie, Pa.	93,372	66,525	40.4	26.2
Evanston, Ill.	37,234	24,978	49.0	29.7
Evansville, Ind.	85,264	69,647	22.4	18.0
Everett, Mass.	40,120	33,484	19.8	37.6
Everett, Wash.	27,644	24,814	11.4	216.6
Fall River, Mass.	120,485	119,295	1.0	13.8
Fitchburg, Mass.	41,029	37,826	8.4	20.0
Flint, Mich.	91,599	38,550	137.6	194.2
Fort Smith, Ark.	28,870	23,975	20.2	106.9

Cities	Population 1920	Population 1910	Per Cent. of Increase 1910-1920	Per Cent. of Increase 1900-1910
Fort Wayne, Ind.	86,549	63,933	35.4	41.7
Fort Worth, Tex.	106,482	73,312	45.2	174.7
Fresno, Cal.	45,086	24,892	79.2	99.6
Galveston, Tex.	44,255	36,981	19.7	-2.1
Gary, Ind.	55,378	16,802	229.6	...
Grand Rapids, Mich.	137,634	112,571	22.3	28.6
Green Bay, Wis.	31,017	25,236	22.9	35.1
Hagerstown, Md.	28,064	16,507	70.0	21.5
Hamilton, O.	39,675	35,279	12.5	47.5
Hammond, Ind.	36,004	20,925	72.1	69.1
Hamtramck (village), Mich.	48,615	3,559	1,266.0	...
Harrisburg, Pa.	75,917	64,186	18.3	27.9
Hartford, Conn.	138,036	98,915	39.6	23.9
Haverhill, Mass.	53,884	44,115	22.1	18.7
Hazleton, Pa.	32,277	25,452	26.8	78.9
Highland Park, Mich.	46,499	4,120	1,028.6	864.9
Hoboken, N. J.	68,166	70,324	-3.1	18.5
Holyoke, Mass.	60,203	57,730	4.3	26.3
Honolulu, H. I.	83,327	52,183	59.7	32.8
Houston, Tex.	138,076	78,800	75.2	76.6
Huntington, W. Va.	50,177	31,161	61.0	161.4
Indianapolis, Ind.	314,194	233,650	34.5	38.1
Irvington, N. J.	25,480	11,877	114.5	126.0
Jackson, Mich.	48,374	31,433	53.9	24.8
Jacksonville, Fla.	91,558	57,699	58.7	103.0
Jamestown, N. Y.	38,917	31,297	24.3	36.7
Jersey City, N. J.	298,103	267,779	11.2	29.7
Johnstown, Pa.	67,327	55,482	21.3	54.4
Joliet, Ill.	38,442	34,670	10.8	18.1
Joplin, Mo.	29,902	32,073	-6.9	23.2
Kalamazoo, Mich.	48,487	39,437	23.9	61.6
Kansas City, Kan.	101,177	82,331	22.9	60.1
Kansas City, Mo.	324,410	248,381	30.6	51.7
Kearny, N. J.	26,724	18,659	43.2	71.2
Kenosha, Wis.	40,472	21,371	89.4	84.1
Kingston, N. Y.	26,688	25,908	3.0	5.6
Knoxville, Tenn.	77,818	36,346	114.1	11.4
Kokomo, Ind.	30,067	17,010	76.8	60.3
La Crosse, Wis.	30,421	30,417	-0.2	5.3
Lakewood, O.	41,732	15,181	174.9	352.5
Lancaster, Pa.	53,150	47,227	12.5	13.9
Lansing, Mich.	57,327	31,229	83.6	89.4
Lawrence, Mass.	94,270	85,892	9.8	37.3
Lewiston, Me.	31,791	26,247	21.1	10.5
Lexington, Ky.	41,534	35,099	18.3	33.1
Lima, O.	41,326	30,508	35.4	40.4
Lincoln, Neb.	54,948	43,973	24.9	9.5
Little Rock, Ark.	65,142	45,941	41.5	19.9
Long Beach, Cal.	55,593	17,809	212.2	690.8
Lorain, O.	37,295	28,883	29.1	80.2
Los Angeles, Cal.	576,673	319,198	80.7	211.5
Louisville, Ky.	234,891	223,928	4.9	9.4
Lowell, Mass.	112,759	106,294	6.1	11.9
Lynchburg, Va.	30,070	29,494	1.6	56.1
Lynn, Mass.	99,148	89,336	11.0	30.4
McKeesport, Pa.	46,781	42,694	7.7	24.7
Macon, Ga.	52,995	40,665	30.3	74.7
Madison, Wis.	38,378	25,531	50.3	33.2
Malden, Mass.	49,103	44,404	10.6	31.9
Manchester, N. H.	78,384	70,063	11.9	22.9
Mansfield, O.	27,824	20,768	34.0	17.7
Marion, O.	27,891	18,232	53.0	53.7
Medford, Mass.	39,038	23,150	68.6	26.9
Memphis, Tenn.	162,351	131,105	23.8	28.1
Meriden, Conn.	34,764	27,265	9.5	12.2

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Cities	Population 1920	Population 1910	Per Cent. of Increase 1910-1920	Per Cent. of Increase 1900-1910
Miami, Fla.	29,571	5,471	440.1	225.5
Milwaukee, Wis.	457,147	373,857	22.3	31.0
Minneapolis, Minn.	380,582	301,408	26.3	48.7
Mobile, Ala.	60,777	51,521	16.8	33.9
Moline, Ill.	30,734	24,199	26.9	40.3
Montclair, N. J.	28,810	21,550	33.7	54.3
Montgomery, Ala.	43,464	38,136	14.0	25.7
Mt. Vernon, N. Y.	42,726	30,919	38.2	45.7
Muncie, Ind.	36,524	24,005	52.2	14.6
Muskegon, Mich.	36,570	24,062	52.0	15.6
Muskogee, Okla.	30,277	25,278	19.8	494.2
Nashua, N. H.	28,379	26,005	9.1	8.8
Nashville, Tenn.	118,342	110,364	7.2	36.5
Newark, N. J.	414,524	347,469	19.2	41.2
Newark, O.	26,718	25,404	5.2	39.9
New Bedford, Mass.	121,217	96,652	25.4	54.8
New Britain, Conn.	59,316	43,916	35.1	68.9
New Brunswick, N. J.	32,779	23,388	40.2	16.9
Newburgh, N. Y.	30,366	27,805	9.2	11.5
Newcastle, Pa.	44,938	36,280	23.9	28.0
New Haven, Conn.	162,537	133,605	21.6	23.7
New London, Conn.	25,688	19,659	30.7	12.0
New Orleans, La.	387,219	339,075	14.2	18.1
Newport, Ky.	29,317	30,309	-3.3	7.1
Newport, R. I.	30,255	27,149	11.4	21.0
Newport News, Va.	35,596	20,205	76.2	2.9
New Rochelle, N. Y.	36,213	28,826	25.4	96.1
Newton, Mass.	46,054	39,806	15.7	18.5
New York, N. Y.	5,620,048	4,766,883	17.9	38.7
Niagara Falls, N. Y.	50,760	30,445	66.7	56.5
Norfolk, Va.	115,777	67,452	71.6	44.7
Norristown, Pa.	32,319	27,875	15.9	25.2
Norwalk, Conn.	27,700	15,922	74.0	25.2
Norwich, Conn.	29,685	28,219	5.2	14.5
Oakland, Cal.	216,261	150,174	44.1	124.3
Oak Park (village), Ill.	39,858	19,444	104.8	...
Ogden, Utah	32,804	25,580	28.2	56.8
Oklahoma City, Okla.	91,295	64,205	42.1	539.7
Omaha, Neb.	191,601	124,096	54.4	21.0
Orange, N. J.	33,268	29,630	12.3	22.7
Oshkosh, Wis.	33,162	33,062	0.3	16.9
Pasadena, Cal.	45,354	30,291	49.7	232.2
Passaic, N. J.	63,841	54,773	16.5	97.2
Paterson, N. J.	135,875	125,600	8.2	19.4
Pawtucket, R. I.	64,248	51,622	24.5	31.6
Pensacola, Fla.	31,035	22,982	35.0	29.5
Perth Amboy, N. J.	41,707	32,121	29.8	81.5
Petersburg, Va.	31,012	24,127	28.5	10.6
Philadelphia, Pa.	1,823,779	1,549,008	17.7	19.7
Phoenix, Ariz.	29,053	11,134	160.9	100.8
Pittsburgh, Pa.	588,343	533,905	10.2	18.2
Pittsfield, Mass.	41,763	32,121	30.0	47.6
Plainfield, N. J.	27,700	20,550	34.8	33.7
Pontiac, Mich.	34,273	14,532	135.8	48.8
Port Huron, Mich.	25,944	18,863	37.5	-1.5
Portland, Me.	69,272	58,571	18.3	16.8
Portland, Ore.	258,288	207,214	24.6	129.2
Portsmouth, O.	33,011	23,481	40.6	31.4
Portsmouth, Va.	54,387	33,190	63.9	90.5
Poughkeepsie, N. Y.	35,000	27,936	25.3	16.3
Providence, R. I.	237,031	224,326	5.9	27.8
Pueblo, Colo.	43,050	44,395	-3.3	57.7
Quincy, Ill.	35,978	36,587	91.7	0.9
Quincy, Mass.	47,876	32,642	46.7	36.6

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Cities	Population 1920	Population 1910	Per Cent. of Increase 1910-1920	Per Cent. of Increase 1900-1910
Racine, Wis.	58,593	38,002	54.2	30.6
Reading, Pa.	107,784	96,071	12.2	21.7
Revere, Mass.	28,823	18,219	58.2	75.3
Richmond, Ind.	26,765	22,324	19.9	22.5
Richmond, Va.	171,667	127,628	34.5	50.1
Roanoke, Va.	50,842	34,874	45.8	62.2
Rochester, N. Y.	295,750	218,149	35.6	34.2
Rockford, Ill.	65,651	45,401	44.6	46.2
Rock Island, Ill.	35,177	24,335	44.6	24.8
Rome, N. Y.	26,341	20,497	28.5	33.6
Sacramento, Cal.	65,908	44,696	47.3	52.6
Saginaw, Mich.	61,903	50,510	22.6	19.3
St. Joseph, Mo.	77,939	77,403	0.7	-24.8
St. Louis, Mo.	772,897	687,029	12.5	19.4
St. Paul, Minn.	234,698	214,744	9.2	31.7
Salem, Mass.	42,529	43,697	-2.7	21.5
Salt Lake City, Utah	92,777	92,777	27.3	73.3
San Antonio, Tex.	118,110	96,614	67.0	81.2
San Diego, Cal.	161,379	39,578	88.7	123.6
San Francisco, Cal.	74,683	416,912	21.9	21.6
San Jose, Cal.	39,642	28,946	36.8	34.6
Savannah, Ga.	83,252	65,064	28.0	19.9
Schenectady, N. Y.	88,723	72,826	21.8	129.9
Scranton, Pa.	137,783	129,867	6.1	27.3
Seattle, Wash.	315,312	237,194	33.1	194.0
Sheboygan, Wis.	30,955	26,398	17.3	15.0
Shreveport, La.	43,874	28,015	56.6	75.0
Sioux City, Ia.	71,227	47,828	48.9	44.4
Sioux Falls, S. D.	25,202	14,094	78.6	37.3
Somerville, Mass.	93,091	77,236	20.5	25.3
South Bend, Ind.	70,983	53,684	32.2	49.1
Spokane, Wash.	104,437	104,402	...	183.3
Springfield, Ill.	59,183	51,678	14.5	51.3
Springfield, Mass.	129,614	88,926	45.7	43.3
Springfield, Mo.	39,631	35,201	12.6	51.3
Springfield, O.	60,840	46,921	29.7	22.7
Stamford, Conn.	40,067	28,836	39.6	57.1
Steubenville, O.	28,508	23,391	27.3	56.0
Stockton, Cal.	40,296	23,253	73.3	32.8
Superior, Wis.	39,671	40,384	-1.9	29.9
Syracuse, N. Y.	171,717	137,249	25.1	26.6
Tampa, Fla.	51,608	37,782	35.7	138.5
Tacoma, Wash.	96,965	83,743	15.8	122.0
Taunton, Mass.	37,137	34,259	8.4	10.4
Terre Haute, Ind.	66,083	58,157	13.6	58.6
Toledo, O.	243,164	168,497	44.3	27.8
Topeka, Kan.	50,022	43,684	14.5	30.0
Trenton, N. J.	119,289	96,815	23.2	32.1
Troy, N. Y.	72,013	76,813	-6.2	26.6
Tulsa, Okla.	72,075	18,182	296.4	1,208.1
Utica, N. Y.	94,156	74,419	26.5	32.0
Waco, Tex.	38,500	26,425	45.7	27.7
Waltham, Mass.	30,915	27,834	11.1	18.5
Warren, O.	27,050	11,081	144.1	29.9
Washington, D. C.	437,571	331,069	32.2	18.8
Waterbury, Conn.	91,715	73,141	25.0	59.5
Waterloo, Ia.	36,230	23,693	35.7	112.2
Watertown, N. Y.	31,285	26,730	17.0	23.2
West Hoboken, N. J.	40,074	35,403	13.2	53.3
West New York (town), N. J.	29,926	13,560	120.7	157.5
Wheeling, W. Va.	56,208	41,641	30.5	7.1
Wichita, Kan.	42,217	52,450	37.5	112.6
Wichita Falls, Tex.	40,079	8,200	388.8	230.6
Wilkes-Barre, Pa.	73,833	67,105	10.0	29.7

CITIES	POPULATION		PER CENT. OF INCREASE	
	1920	1910	1910-1920	1900-1910
Williamsport, Pa.	36,198	31,860	13.6	10.8
Wilmington, Del.	110,168	87,411	26.0	14.3
Wilmington, N. C.	33,372	25,748	29.6	22.7
Winston-Salem, N. C.	48,395	22,700	113.2	66.3
Woonsocket, R. I.	43,496	38,125	14.1	35.2
Worcester, Mass.	179,754	145,986	23.1	23.3
Yonkers, N. Y.	100,176	79,803	25.6	66.5
York, Pa.	47,512	44,750	6.2	32.8
Youngstown, O.	132,358	79,066	67.4	76.2
Zanesville, O.	29,569	28,026	5.5	19.1

CENT, or CENTIME (*san-tēm*), the name of a small coin in various countries, so called as being equal to a 100th part of some other coin. In the United States and in Canada the cent is the 100th part of a dollar. In France the centime is the 100th part of a franc. Similar coins are the *centavo* of Chili, and the *centesimo* of Italy, Peru, etc. Cents or centimes, and their equivalents, are written simply as decimals of the unit of value.

CENTAUR, a mythical creature, half man, half horse, said to have sprung from the union of Ixion and a Cloud; the most celebrated was Chiron. They inhabited Thessaly, and were also called Hippocentauri. The myth probably arose from some herdsman on horseback, who, being seen by individuals unacquainted with the uses of the horse, was supposed to form, together with his steed, one integral body.

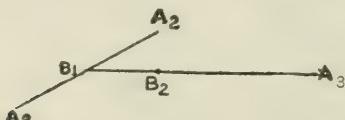
It is also the name of a constellation in the Southern Hemisphere.

CENTER, a point equi-distant from the extremities of an object. Among its best known applications are:

Center of Inertia.—If m_1 and m_2 be the masses of two particles placed at the points A_1 and A_2 , and if the right line A_1A_2 be divided in B_1 , so that

$$m_1A_1B_1 = m_2A_2B_1,$$

the point B_1 is called the center of iner-



tia, or center of mass, of the two particles. If m_3 be a third mass at A_3 , and if B_1A_3 be divided in B_2 , so that

$$(m_1 \times m_2) B_1B_2 = m_3A_3B_2,$$

B_2 is called the center of inertia of the three particles. In general, if there be any number of particles, a continuation of the above process will enable us to

find their center of inertia. Every body may be supposed to be made up of a multitude of particles connected by cohesion. From this it is obvious that the center of inertia is a definite point for every piece of matter.

Center of Gravity.—If a body be sufficiently small, relatively to the earth, the weights of its particles may be considered as constituting a system of parallel forces acting on the body. Now, the magnitude of the weight of a particle is proportional to its mass. Hence, the line of action of the resultant of the parallel forces will approximately pass through the center of inertia. For this reason such bodies are said to have a center of gravity. Strictly speaking, there is no such point of necessity for every body, since the directions of the forces acting on the body are not accurately parallel. Hence, it is only approximately that we can say of a body that it has a center of gravity. On the other hand, every piece of matter has, as is shown above, a center of inertia. For all heavy bodies of moderate dimensions it is, however, sufficiently accurate to assume that the center of inertia and gravity coincide. For example, the center of gravity of a uniform homogeneous cylinder with parallel ends is the middle point of its axis, that of a uniformly thin circular lamina its center, and so on.

The center of gravity of a body of moderate dimensions may be approximately determined by suspending it by a single cord in two different positions, and finding the single point in the body which, in both positions, is intersected by the axis of the cord.

The term center of gravity is also used in a stricter sense than the one just explained. Thus, if a body attracts and is attracted by all other gravitating matter as if its whole mass were concentrated in one point, it is said to have a true center of gravity at that point, and the body itself is called a *centrobaric* body. A spherical shell of uniform gravitating matter attracts an external particle as if its whole mass were con-

densed at its center. Such a body has a true center of gravity. When such a point exists, it necessarily coincides with the center of inertia.

Center of Oscillation.—A heavy particle suspended from a point by a light, inextensible string constitutes what is called a simple or mathematical pendulum. For such a pendulum it is easily proved that the time of an oscillation from side to side of the vertical is proportional to the square root of its length for any small arc of vibration. A simple pendulum is, however, a thing of theory,

former. There is thus one particle which will be accelerated and retarded to an equal amount, and which will, therefore, move as if it were a simple pendulum unconnected with the rest of the body. The point in the body occupied by this particle is called the center of oscillation.

As all the particles of the body are rigidly connected, they all vibrate in the same time. Hence it follows that the time of vibration of the rigid body will be the same as that of a simple pendulum, called the equivalent or isochronous simple pendulum, whose length is equal



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as in all physical problems we have to deal with a rigid mass, and not a particle, oscillating about a horizontal axis. In a pendulum of this kind the time of oscillation will not vary as the square root of the length of the string, for it is obvious that those particles of the body which are nearest the point of suspension will have a tendency to vibrate more rapidly than those remote. The former are, therefore, retarded by the latter, while the latter are accelerated by the

to the distance between the centers of suspension and oscillation.

The determination of the center of oscillation of a body requires the aid of the calculus. It may be stated, however, that it is always farther from the axis of suspension than the center of inertia, and is always in the line joining the centers of suspension and oscillation. Let A be the center of suspension, B the center of inertia, and C the center of oscillation, and let AB be equal to h , and k to the

radius of gyration of the body about an axis through B parallel to the fixed axis, then it is easily shown that

$$AC = \frac{(h^2 + k^2)}{h}$$

From this there follows the important proposition that the centers of oscillation and suspension are convertible, a proposition which was taken advantage of by Kater for the practical determination of the force of gravity at any station.

CENTERVILLE, a city of Iowa, the county-seat of Appanoose co. It is on the Chicago, Burlington, and Quincy, the Chicago, Rock Island, and Pacific, and the Southern Iowa Traction Company railroads. The city is an important livestock center. There are also mines of coal, gypsum, and limestone. Other industries are railway shops and manufactures of lumber, flour, iron, etc. Pop. (1910) 6,936; (1920) 8,486.

CENTIGRADE THERMOMETER, a thermometer scaled to represent the interval between the freezing and the boiling point of water, divided into 100 equal parts, the freezing-point being taken as zero, and the boiling-point as 100°. 1° C. is equal to 1.8° F.

CENTIME. See CENT.

CENTIPEDE, a genus of *Myriopoda*, having a long, slender, depressed body, protected by coriaceous plates, 21 pairs of legs, distinct eyes, 4 on each side, and antennæ with 17 joints. The name is, however, popularly extended to species of nearly allied genera. Centipedes run nimbly, feed on insects, and pursue them into their lurking places. They have not only a pair of horny jaws, like those of insects, but also another pair of organs closely connected with the mouth, and which are regarded as transformed legs, dilated and united at the base, terminated by a strong hook, and pierced beneath the extremity for the emission of a venomous fluid, which makes their bite quickly fatal to insects, and, in the case of the larger species, very painful, and even dangerous to the larger animals and to man.

CENTRAL AMERICA, a geographical division, including the stretch of territory from the Isthmus of Panama to the Isthmus of Tehuantepec, but by political arrangements the limits most generally assigned to it include the Republics of Guatemala, Honduras, San Salvador, Nicaragua, Costa Rica, and Panama, with British Honduras. It thus has Mexico on the N. W., Colombia on the S. E., and the Pacific Ocean and Caribbean Sea on either side. Its entire

length may be about 800 miles, with a breadth varying from between 20 and 30 to 350 miles. It is generally mountainous, contains a number of active volcanoes, and on the whole is a rich and fertile, but almost totally undeveloped region. The area is about 220,000 square miles; the pop., about 5,500,000.

CENTRAL FALLS, a town in Providence co., R. I., on the Blackstone river, and the New York, New Haven, and Hartford railroad, 4½ miles N. of Providence. It has large manufactories of cotton, woolen, silk, and hair cloth goods, and of machinery and leather, for which the river supplies excellent power. There are several churches, newspapers, and banks. Pop. (1910) 22,754; (1920) 24,174.

CENTRALIA, a city of Marion co., Ill., 60 miles E. of St. Louis and 252 miles S. W. of Chicago, on the Illinois Central, the Chicago, Burlington and Quincy, the Southern, and the Southern Illinois railroads. It is located in the orchard section of southern Illinois, and its fruit trade is large. There are manufactories of iron, steel, envelopes, knit goods, flour, and butter, and the machine works of the Illinois Central railroad. There are three banks, ten churches, high schools, and public schools, and a Carnegie library. Centralia was settled in 1853 and became a city in the following year. Pop. (1910) 9,680; (1920) 12,491.

CENTRALIA, a city of Lewis co., Wash., midway between Portland and Seattle. The chief industries are lumber, coal, and canned goods. The water-works and electric lighting plant are municipally owned. There are two banks, excellent schools and a Carnegie library. Centralia was first settled in 1857 and became a city in 1890. It is under a commission form of government. A tragedy that startled the nation occurred there on Nov. 11, 1919, during a parade of war veterans to celebrate the first anniversary of the signing of the armistice. Concealed members of the I. W. W. opened fire on the procession and several of the soldiers were killed. One of the assailants was killed in the fighting that followed, another was lynched, and others charged with committing the crime were arrested and held for trial. Pop. (1910) 7,311; (1920) 7,549.

CENTRAL PARK, the most noted park in New York City. It contains 840 acres and extends from 59th street to 110th street, and from Fifth avenue to Eighth avenue. It was laid out by Messrs. Olmsted and Vaux, and contains





among other objects of interest, the Mall, the Croton Reservoirs, Cleopatra's Needle (the Obelisk), the Metropolitan Museum of Art, zoölogical and botanical gardens, many statues, the Arsenal, and several natural and artificial lakes.

CENTRAL PROVINCES and **BERAR**, an extensive British territory in India. They became a separate administration in 1861, and are under the authority of a chief commissioner. Their total area is about 130,000 square miles, of which about 100,000 square miles are British territory, and about 31,000 the territory of native protected states, 15 in number. For administrative purposes the province is divided into four commissionerships, Jabalpur (Jubbulpore), Nagpur, Narbada (Nerbudda), and Chattisgarh. Pop. about 16,000,000, chiefly Hindus. The chief town and seat of the central administration is Nagpur.

CENTRAL UNIVERSITY OF KENTUCKY, an educational institution in Danville, Ky., organized in 1819, under the auspices of the Presbyterian Church; reported at the close of 1919: professors and instructors, 16; students, 269; president, William A. Ganfield, LL. D.

CENTRAL WESLEYAN COLLEGE, a co-educational institution in Warrensburg, Mo., organized in 1864, under the auspices of the Methodist Episcopal Church; reported at the end of 1919: professors and instructors, 22; students, 325; number of graduates, 810; president, Otto E. Krieger, D. D.

CENTRIFUGAL, a machine used in clarification and filtration, especially of sugar. The essential part is a circular vessel so constructed as to be revolved at a high rate of speed, which deposits the matter to be removed at the bottom, allowing the clear fluid to be drawn off.

CENTURY-PLANT, a popular name of the *Agave americana*, or American aloe.

CEOS (sometimes called by the Italianized name of *Zea* or *Tzia*), one of the Cyclades, in the Aegean Sea, 14 miles off the Attic coast. It is 13 miles long, 8 broad and 39 square miles in area. The central and culminating point is Mount Elias, 1,863 feet high. It is fairly fertile, raising fruit, wine, honey, and vassonia. Pop. about 4,000.

CEPHALIZATION, in biology, a term proposed to denote a tendency in the development of animals toward a localization of important parts in the neighborhood of the head, as by the transfer of locomotive members or limbs to the head (in the Cephalopoda, for example). The

term is also used to indicate the degree in which the brain dominates over the other parts of the animal structure.

CEPHALONIA (ancient, *Kephallenia*), an island of Greece, the largest of the Ionian islands, W. of the Morea, at the entrance of the Gulf of Patras, about 31 miles in length, and from 5 to 12 in breadth; area, about 300 square miles; pop. about 75,000. The coastline is very irregular and deeply marked with indentations, and the surface is rugged and mountainous, rising in Monte Negro, the ancient Ænos, to a height of 5,380 feet. There is rather a deficiency of water on the island. The principal towns are Argostoli (pop. about 14,000), and Lixuri (pop. about 6,000). The chief exports are currants, oil, and grain; wine, cheese etc., are also exported. The manufactures are inconsiderable. Earthquakes are not infrequent.

CEPHISSUS, one of the two rivers which water the Athenian plain. It rises on the W. slope of Mount Pentelicus and the S. side of Mount Parnes, and flows past Athens on the W. into the Saronic Gulf near Phalerum.

CERAM, an island in the Moluccas, W. of New Guinea; area about 7,000 square miles; pop. about 75,000. It is about 200 miles long with an average width of 35 miles. Its interior is traversed by mountain ranges from 6,000 to 8,000 feet high, but is little known. The vegetation is luxuriant, the sago-palm supplying the chief food of the inhabitants as well as an article of trade. The inhabitants of the coast are of Malay origin, the interior being peopled by Alfories. It is under the Dutch.

CERATE, the name of an external medicament, more or less liquid, having for its basis wax and oil. Simple cerate consists of 8 ounces of lard and 4 of white wax melted together and stirred till cold.

CERBERUS, the three-headed dog which guards the entrance of the kingdom of Hades and Persephone. Orpheus, when he descended into the infernal regions in search of Eurydice, lulled him to sleep with his lyre; and Hercules dragged him from the gate of Hades, when he went to redeem Alceste. The fellow-monster of Cerberus was Orthros. The names of these dogs appear in the Vedic poems under the forms of Sarvara and Vritra, the two dogs of Yama.

CEREALIA, the festival of Ceres, celebrated at Rome.

CEREALS, a term derived from Ceres, the goddess of corn; though sometimes extended to leguminous plants, as beans, lentils, etc., is more usually and properly confined to the *Gramineæ*, as wheat, barley, rye, oats, and other grasses, cultivated for the sake of their seed as food.

CEREBRATION, exertion or action of the brain, conscious or unconscious.

CEREBRO-SPINAL, pertaining to the brain and spinal cord together, looked on as forming one nerve mass.

CEREBRO-SPINAL MENINGITIS. See MENINGITIS.

CERES (sē'rēz), the daughter of Saturn and Vesta, and goddess of corn, harvests, and tillage. To Jupiter she bore a daughter, Proserpine. Ceres corresponds with the *Isis* of the Egyptians, and the *Demeter* of the Greeks. She is represented with a garland of ears of corn on her head, holding in one hand a lighted torch, and in the other a poppy, which was sacred to her. The Romans instituted in her honor the festivals called *Cerealia*.

CERIGNOLA, a town 24 miles southeast of the city of Foggia, south Italy, in the province of the same name. Large quantities of oil, cotton, and almonds are produced in the surrounding district. The principal manufacture is linen. The town has several convents, a hospital and a college. A battle took place there in 1503 between the Spaniards under the Duke of Cordova and the French under the Duc de Nemours, the latter's forces being defeated and he himself slain. Pop. about 40,000.

CERITHIUM, the typical genus of the family *Cerithiadæ*. One hundred and thirty-six recent species are known, and 460 fossils, the latter from the Trias onward till now.

CERIUM, a metal (Sym. Ce.; at. wt., 140.25); found with two other metals, lanthanum, and didymium, in cerite. Powdered cerite is made into a thick paste with concentrated sulphuric acid, and heated nearly to redness. The mass is then treated with water, saturated with H₂S, filtered, acidified with HCl, and precipitated by oxalic acid. This precipitate heated in the air to redness gives a brown powder of the mixed oxides. Nitric acid dissolves the oxides of lanthanum and didymium, and leaves the oxides of cerium. The oxides of lanthanum and didymium are separated by the repeated crystallization of their sulphates. Cerium is obtained by reducing its chloride with sodium as a gray pow-

der which decomposes water slowly. It dissolves in dilute acids with evolution of hydrogen. Cerous oxide, CeO, obtained by igniting the carbonate or oxalate, is a grayish-blue powder, which, in the air, oxidizes into ceroso-ceric oxide, Ce₂O₃, a yellowish-white powder. The salts of the former are colorless, those of the latter brown-red or yellow.

CERRO BLANCO, a mountain in New Mexico; summit 14,269 feet.

CERRO DE PASCO, the capital of the Peruvian department of Junin, stands at an elevation of 14,276 feet, 138 miles N. E. of Lima. Near it are some of the richest silver mines on the continent. There are also very valuable copper and coal mines. The climate is cheerless and inclement. Pop. about 14,000, mostly Indians and half-breeds.

CERRO GORDO (ther'ō-gor'dō) [Sp. "Big Mountain"], a mountain-pass in Mexico, through which passes the National road from Vera Cruz to Jalapa and Mexico. It is celebrated as the scene of a victory by General Scott with 9,000 United States troops over an army of 13,000 Mexicans under Santa Ana, April 17-18, 1847. To intercept Scott on his march from Vera Cruz, the Mexicans took up a strong position in the pass and on the heights commanding it, but after two days' skirmishing, Scott succeeded in dislodging and utterly routing them, with a total loss to himself of only 431 killed and wounded. This victory enabled Scott to take the town of Jalapa the following day.

CERRO GORDO DE POTOSI, a mountain in the Andes of Bolivia; S. W. of Potosi; 16,150 feet in height; remarkable for its deposits of silver.

CERRO LARGO, a department in the N. E. of Uruguay, well watered, with large savannahs and forests. Area, 5,753 square miles; pop. about 60,000, chiefly engaged in cattle-raising. Capital, Cerro Largo or Melo.

CERROS, or **CEDROS ISLAND**, an island belonging to Mexico, in the Pacific Ocean, off the W. coast of Lower California. It is for the most part mountainous and barren, but is thought to possess mineral wealth. Area 120 square miles.

CERTALDO, a town of central Italy, 19 miles S. W. of Florence. It is noteworthy as the residence of Boccaccio, who was born and died here. His house is still standing, much as it was in the poet's time. Pop. about 11,000.

CERVANTES SAAVEDRA, MIGUEL DE (ser-van'tēz or ther-vän'tes sä-ä-vā')

drä), a Spanish romancist, born in Alcalá de Henares in 1547. He wrote many romances and stories, but he lives in fame through "Don Quixote." He served some years in the army; was captured by corsairs and held five years in servitude. His fellow captives testified to his self-denying services to them while in the hands of the Algerines. His first attempt in literature was the composition of a pastoral romance, "Galatea," in the traditional style and spirit. Of 20 or 30



CERVANTES

plays written by him, only two survive, and they have no celebrity. The first part of "Don Quixote" was published in 1605, and it had a hearty reception from the beginning among the populace, though not among the cultured classes. Before the year was out, five editions, some authorized, others pirated, were published, and the Don and his grotesque retainer appeared like immemorial traditional characters in every pageant. The continuation of the immortal story, however, did not appear till 1615—and then because spurious continuations published under his name fairly forced Cervantes' hand. Meanwhile he busied himself with writing poems and novels now forgotten. On all these dead works he bestowed great care before he gave them to the public; he wrote "Don Quixote" with "running pen." He died in Madrid, April 23, 1616.

CERVERA Y TOPETE, PASCUAL (ther-vā'rā ē to-pā'tā), a Spanish naval

officer; born in the province of Jerez, in 1833, of noble birth, his mother being a daughter of Count Topete y Valle, of Spain's royal family. He was a nephew of Admiral Topete, one of the most illustrious of Spain's naval officers and a man of great influence in the early part of the 19th century. Cervera was graduated at the Naval Academy of San Fernando; entered on active service in 1851; and was made first lieutenant in 1859; captain in 1868; and admiral subsequently. He was a prominent factor in the 10-years' war in Cuba, when he succeeded in blockading the ports and preventing the landing of filibusters; was sent to London, as a representative of Spain, to take part with other nations in a conference bearing on naval questions of international importance; and commanded the fleet sent against the American squadron operating in Cuban waters after the declaration of war in 1898. He took refuge in the inner harbor of Santiago de Cuba, and when, on July 3, he attempted to escape, under imperative orders from his superiors, his entire fleet was destroyed by the squadron under Rear-Admiral Sampson. Admiral Cervera and his surviving officers were sent to Annapolis, Md., as prisoners of war, and soon afterward were released and allowed to return to Spain. Cervera was a man of cultured and genial manners, of a kindly disposition and a gallant officer, for whom his captors felt the greatest admiration and sympathy. He died April 3, 1909.

CERVUS, the genus of animals to which the stag belongs, forming the type of the deer family, *Cervidae*.

CESENA (chā-sā'na), a hill-town in the province of Forli, central Italy, on the Emilian Way. Among its buildings are: A library founded (1452) by Domenico Malatesta Novello, which possesses 4,000 precious manuscripts; a Capuchin church containing one of the best of Guercino's paintings, and a noble cathedral. Productive sulphur mines are in the neighborhood; and the region has been noted ever since Roman times for the excellence of its wine. Cesena was the birthplace of Popes Pius VI. and VII. In 1357, under Maria Ordelaffi, it made a famous defense against Albornoz; but in 1377 it was barbarously pillaged by Robert of Genf. On March 30, 1815, Murat gained a victory at this place over the Austrians. Pop. about 40,000.

CESNOLA, LUITA PALMA DI (ches-nō'lā), an American archæologist, born in Piedmont, Italy, June 29, 1832. He served in the Italian war with Austria and came to the United States in

1860, serving in the Civil War, and attaining the rank of Brigadier-General. He was United States Consul at Cyprus (1865-1877), where he made extensive archaeological discoveries. In 1878 he became a trustee and director of the Metropolitan Museum of Art, in New York City. In 1897 he was awarded a Congressional medal of honor for conspicuous military service. He wrote "Cyprus," "Cypriote Antiquities," and many similar works. He died in 1904.

CÉSPEDES Y BORGES, CARLOS MANUEL DE (thä斯-pä'-thä斯-ä bor'gäs'), a noted Cuban insurgent, born in Bayamo, April 18, 1919. He studied at the University of Havana, and later at Barcelona, Spain. Implicated in Prim's conspiracy, he was banished from Spain (1843), and returned to Cuba to practice law. As leader of the revolt of 1868, he was chosen by the insurgents President of the newly proclaimed republic. He was killed in a skirmish with the Spaniards, March 22, 1872.

CETTE (set), an important seaport town of France, in the department of Hérault, built on a neck of land between the lagoon of Thau and the Mediterranean, 23 miles S. W. of Montpellier. The space inclosed by the piers and breakwaters forming the harbor can accommodate about 400 vessels; and the harbor is defended by forts. A broad, deep canal, lined with excellent quays, connects the port with the Lake of Thau, and so with the Canal du Midi and the Rhône, thus giving to Cette an extensive inland traffic; it has likewise an active foreign commerce. The principal trade is in wine, brandy, salt, dried fruits, fish, dye-stuffs, perfumery, and verdigris. Cette has shipbuilding yards, salt-works, glass-works, factories for the manufacture of syrups and grape-sugar, etc. It is a resort for sea-bathing, and has extensive fisheries. Colbert founded it in 1666. Pop. about 35,000.

CETTINJE, or CETINJE, (chet-ten'yä), the capital of the former kingdom of Montenegro; situated in a lofty mountain-valley, 19 miles E. of Cattaro, with which it is connected by a steep road. It contains a royal palace and a convent founded in 1478. Turkish invaders sacked and burnt the town in 1683, 1714, and 1785, but it was each time rebuilt. Many famous Montenegrin rulers lie buried here. It was occupied by the Austrians during the WORLD WAR (*q. v.*) in January, 1916. Pop. about 5,000.

CEUTA (thä'yü-tä), a fortified port belonging to Spain, on the coast of Morocco, opposite Gibraltar. The town oc-

cupies the site of the Roman colony of *Ad Septem Fratres*, so called from the seven hills rising here in a group, of which the most prominent are Montes Almina and Hacho; on the latter, the ancient *Abyla* (one of the Pillars of Hercules), is a strong fort, and on the former, among beautiful gardens, lies the New Town. Ceuta contains a cathedral, a hospital, and convents, but is chiefly of importance as a military and convict station. The harbor is small, and exposed to the N., but has a lighthouse and some small trade. The mixed population number about 25,000. The place was a flourishing mart under the Arabs, who corrupted its Roman name to Sebtah; there the first paper manufactory in the W. world is said to have been established by an Arab who had brought the industry from China. In 1415 it was captured by the Portuguese, and annexed to Portugal; it fell to Spain in 1580.

CÉVENNES (sev-en', ancient Cévenna), the chief mountain range in the S. of France. With its continuations and offsets, it forms the watershed between the river systems of the Rhône and the Loire and Garonne. Its general direction is from N. E. to S. W., beginning at the S. extremity of the Lyonnais mountains, and extending under different local names as far as the Canal du Midi, which divides it from the N. slopes of the Pyrenees. The Cévennes extend for over 150 miles, through or into nine departments, the central mass lying in Lozère and Ardèche, where Mount Lozère attains 5,584 feet, and Mount Mézenc (the culminating point of the chain) 5,754 feet. The average height is from 3,000 to 4,000 feet. The mountains consist chiefly of primary rocks, covered with tertiary formations, which in many places are interrupted by volcanic rocks.

CEYLON, an island and British possession at the south end of Hindustan in the Indian Ocean. The area is 25,481 square miles. It is about 376 miles long by 139 miles wide. The estimated population in 1918 was 4,632,400. The Maldivian Islands are really a part of the Ceylon government, although the people have the choice of electing a sultan of their own. Their population is about 72,000. The principal cities with their population in 1911 were: Colombo, 211,274; Galle, 39,960; Jaffna, 40,411; Kandy, 29,451.

Topography.—The island is pear-shaped—the small end to the N. There are few important indentations. At Trincomalee on the N. E. coast, there is one of the finest natural harbors in the world. Point de Galla on the S. coast is

a regular place of call for the vessels of various lines. A safe and commodious harbor has been provided for Colombo, the capital, on the W. coast. The N. and N. W. coasts are flat and monotonous, those on the S. and E. bold, rocky, and picturesque, with exuberant vegetation. The mountainous regions are confined to the center of the S. and broader part of the island. Their average height is about 2,000 feet, but several summits are upward of 7,000 and one over 8,000 feet high, the culminating point being Pidurutallagalla, 8,296 feet. Adam's Peak, reaching 7,420 feet, is the most remarkable from its conical form, the distance from which it is visible from the sea, and from the legend that thence Buddha ascended to heaven, leaving in evidence a gigantic footprint. The rivers, though numerous, especially in the S. and S. W., are merely mountain streams, navigable only by canoes, and that but for a short distance from their mouths. The most important, the Mahawelli-ganga, which rises near Adam's Peak, and falls into the sea by a number of branches near Trincomalee, has a course of 134 miles, and drains upward of 4,000 square miles. There are a few pretty extensive lagoons in the island yielding large quantities of salt, but no lakes worth noticing.

Climate and Productions.—In respect to climate it is found that where the jungle has been cleared away, and the land drained and cultivated, the country is perfectly healthy; but where low wooded tracts and flat marshy lands abound it is malarial and insalubrious. Most of the animals found on the opposite continent are native to this island, excepting the tiger. Elephants are numerous, especially in the N. and E. provinces, and licenses for their capture and exportation are issued by government. The wild life of the island includes bears, buffaloes, leopards, hyenas, jackals, monkeys, wild hogs, several species of deer, porcupines, armadilloes, mongooses, the pangolin or scaly ant-eater, the loris or Ceylon sloth, flying-foxes, crocodiles, numerous snakes, partly poisonous, and a great variety of birds of brilliant plumage. In the luxuriance of its vegetable productions Ceylon rivals the islands of the Indian Archipelago, and in some respects bears a strong resemblance to them. Its most valuable products are coffee, tea, rice, cinnamon (which is found almost exclusively in the S. W.), and the cocoa-nut and Palmyra-palm. Attention has been directed latterly to the cultivation of cinchona, cacao, and silk. The chief mineral products are iron, plumbago or graphite, and a vari-

ety of gems, including sapphires, rubies, etc. The pearl-fisheries of Ceylon are famous.

Commerce and Finance.—The principal productions are cocoa-nuts, which in 1917 represented an acreage of 904,674; rice, 702,165; tea, 508,779; rubber, 251,500; cocoa, 41,280; cinnamon, 39,930; grains other than rice, 133,028. The chief minerals are plumbago and mica, the former of which has an average annual production of 30,000 tons.

The total foreign trade of Ceylon in 1918 reached \$126,218,222. Of this amount \$57,657,242 represents imports and \$68,560,980 exports.

The public debt in 1917 was about \$27,000,000, the yearly revenue \$23,500,000, and expenditure \$21,300,000. The railway mileage open for traffic in 1918 was 714. There were 524 postoffices and telegraph wires with a length of 6,953 miles. The clearances of shipping in 1917 were 6,153,778 tons. The exports comprise coffee, tea, plumbago, areca-nuts, cocoa-nut oil, fiber and kernels (copra), cinnamon, cinchona, cacao, etc. The principal articles of import are manufactured goods, chiefly from Great Britain, as cotton manufactures, apparel and haberdashery, iron and steel manufactures, machinery, etc.; from other countries, dried fish, rice, wheat, sugar, tea, cowries, etc. The island is provided with a system of excellent roads, and the railways have a length of about 200 miles. The chief industry is agriculture; manufactures (coir-matting, baskets, cotton cloth, etc.) are unimportant. The Ceylon currency consists of rupees and cents. The weights and measures are those of Great Britain.

Government.—Ceylon is one of the British crown colonies, the government being conducted by a governor and two councils, executive and legislative, of both of which the governor is president. The chief sources of revenue are the customs duties, railway receipts, lands and sales, licenses, and salt-farms.

People.—Buddhism prevails in the interior, and generally among the Singhalese of the sea-coasts. The Singhalese have a colloquial language peculiar to themselves, but their classic and sacred writings are either in Pali or Sanskrit. The Hindu religion (Brahmanism) prevails among the Tamils or population of Indian extraction, which forms a large proportion of the inhabitants of the N. and N. E. districts. The Tamils speak their own Tamil tongue. The inhabitants are divided in accordance with religions as follows: Buddhists, 2,791,120; Hindus, 1,580,450; Mohammedans, 319,965; Christians, 451,584. Schools under the

jurisdiction of the government are 871, with an attendance of about 113,000. The Singhalese possess a native chronicle, the *Mahawanso*, which records the history of the island from 543 B. C. onward, under a long series of kings reigning most frequently at the ancient capital Anuradhapura, the earliest of these being leader of an invading host from India. Buddhism was introduced 307 B. C.

History.—The capital, Anuradhapura, as its ruins still testify, was a place of great extent and magnificence. The island was not known to Europeans till the time of Alexander the Great, and their knowledge of it was long vague and meager. By the time of Pliny it had become better known, and he gained much additional information from Ceylonese envoys that were sent to Rome. In the Middle Ages the country was much troubled by invasions of the Malabars, and for a time it was even tributary to China. It had greatly declined in prosperity when visited by Europeans, the first of whom was Marco Polo in the end of the 13th century. At its most flourishing period its population was probably 10 times as great as at present. Little, however, was known in Europe regarding the island until 1505, when the Portuguese established a regular intercourse with it, and latterly made themselves masters of it. When they arrived the Malabars were in possession of the N., the Moors or Arabs held all the seaports, the rest was under petty kings and chiefs. The Portuguese, who were cruel and oppressive rulers, were subsequently expelled by the Dutch in 1658, after a 20 years' struggle. The Dutch in turn were driven from the island by the British in 1796, though a part of the island remained independent under native princes. The King of Kandy, nominally the sovereign of the island, was deposed in 1815 on account of his cruelties, and the island was then finally annexed by Britain, though a rebellion had to be put down in 1817.

CÉZANNE, PAUL, a French painter; born at Aix-en-Provence in 1839. He was wealthy, being the son of a banker. He came under the influence of the Impressionists and exhibited with them from 1874 to 1877; but the ridicule of the public and differences that rose between him and some leaders of the Impressionist school caused him to retire to Aix in 1879, where he spent the remainder of his life. There he devoted himself to a profound study of the old masters, and sought to combine what was best in their methods and ideas with the

excellences of the more modern school. In that effort he developed a remarkable style that brought him into eminence. His treatment of form and color has long led him to be regarded as one of the greatest of creative artists. Among his best known works are "L'Estaque," "The Card Players," "Still Life," and "The Bouquet." He died at Aix in 1906.

CHABLAIS (sha-blâ), a district of France, in Savoy, S. of the Lake of Geneva. In the 11th century Chablais passed from the possession of the House of Burgundy to that of Savoy, and was finally ceded to France with the rest of Savoy in 1860.

CHAD. See TCHAD.

CHAD, ST. (CEADDÀ), born in Northumbria, became a pupil of St. Aidan, spent part of his youth in Ireland, and in 666 became Bishop of York. Doubt having been cast on the validity of his consecration, he withdrew in 669, but was immediately made Bishop of Mercia, fixing the see at Lichfield. He died in 672, after a life eminent for humility and sanctity.

CHADD'S FORD, a town in Delaware co., Pa.; on Brandywine creek; 30 miles S. W. of Philadelphia. The battle of Brandywine was fought here, Sept. 11, 1777.

CHADWICK, FRENCH ENSOR, an American naval officer, born in Morgantown, W. Va., Feb. 29, 1844. He graduated at the United States Naval Academy in 1866, and became a captain in 1897. During the war with Spain he commanded the armored cruiser "New York," the flagship of the North Atlantic Squadron, and was chief-of-staff to Admiral Sampson. He was promoted rear-admiral in 1903, retired in 1906, and died in 1919.

CHADWICK, GEORGE WHITFIELD, an American musician, born in Lowell, Mass., Nov. 13, 1854. He was graduated at the Leipsic Conservatory, and in 1897 became director of the New England Conservatory of Music. He has won distinction as a composer with "Tabasco," a comic opera; "Jubilee," a symphony; "Columbian Ode," a chorus, and with other compositions. He was a member of the American Academy of Arts and Letters.

CHADWICK, JOHN WHITE, an American writer and Unitarian clergyman, born in Marblehead, Mass., Oct. 19, 1840. His radical sermons attracted attention, and he was a liberal contributor to current literature. Among his works are: "A Book of Poems"; "The Bible of To-day"; "Origin and Destiny"; "A Dar-

ing Faith"; "The Man Jesus"; "The Faith of Reason"; "Old and New Unitarian Belief"; "The Power of an Endless Life," and others. He died Dec. 11, 1904.

CHÆRONEA, a city of Boeotia, in ancient Greece, near the Cephissus, on the borders of Phocis. Philip II., King of Macedon, defeated the united Boeotian and Athenian forces near this place, 338 B. C.; and here, also, Sylla defeated the generals of Mithridates VI. 86 B. C. Plutarch was born here. A few ruins of Chæronea are still existing.

CHAFFEE, ADNA ROMANZA, an American military officer, born in Orwell, O., April 14, 1842. He received a public school education; entered the regular army as a private, July 22, 1861; became a captain, Oct. 12, 1867; and colonel, May 8, 1899. On May 4, 1898, he was commissioned Brigadier-General of volunteers for the war with Spain; on July 8, following, was promoted to Major-General; and on April 13, 1899, was honorably discharged under this commission. On the last mentioned date he was re-appointed a Brigadier-General of volunteers, and on July 19, 1900, the President, having selected him to command the American military forces in China, commissioned him a Major-General of volunteers.

In 1901-1902 General Chaffee was military governor of the Philippines, in 1902-1903 commander of the Department of the East, in 1904-1906 Chief of Staff of the United States Army. In the latter year, after 40 years' successful and distinguished service, he was retired with the rank of Lieutenant-General. He died Nov. 1, 1914.

CHAFFINCH, a European bird, so called because it delights in chaff, and is by some much admired for its song. This well-known and beautiful bird is locally called spink, beech-fin, pink, twink, skelly, shell-apple, horse-fin, scobby, and shilfa. It is the *Fringilla cælebs* of ornithologists. It makes a beautiful nest, with four or five eggs, bluish-white, tinged with pink and with spots and streaks of purplish red.

CHAFIN, EUGENE WILDER, American temperance advocate; born in East Troy, Wis., Nov. 1, 1852. He practiced law at Waukesha, Wis., from 1876 to 1900. From 1901 to 1904 he was superintendent of the Washingtonian Home, Chicago. He was active in the early stages of the Prohibition movement, both as a speaker and an organizer. His prominence in the movement led to his selection as candidate for Governor of Wisconsin in 1898. His party chose him as

its presidential nominee in 1908 and 1912. He was admitted to the bar of the Supreme Court in 1909. He became a resident of Arizona in 1909. Among his writings are "Lives of the Presidents" (1896); "Lincoln, the Man of Sorrows" (1908), and "Washington as a Statesman" (1909).

CHAGOS ISLANDS (chā/gōs), a group of islands in the Indian Ocean belonging to Great Britain; a S. extension of the Maldiv Islands. The largest, called Diego Garcia or Great Chagos, 100 miles S. of the main group, is about 15 miles long by 3 broad. They are scantily peopled, and the chief product is cocoa-nut oil. Administratively they are attached to Mauritius. Area, about 76 square miles.

CHAGRES, a town of the Republic of Panama, on the N. coast of the Isthmus of Panama, at the mouth of the Chagres river. It is a poor place, with a harbor for vessels drawing from 10 to 12 feet of water. The river of the same name rises about 10 miles N. E. of Panama, makes an immense bend round to the N. E., and enters the Caribbean Sea. Though toward its mouth it varies in depth from 16 to 30 feet, it is yet, by reason at once of its rapidity and its falls, but little available for navigation. The route of the Panama Canal is by the valley of the Chagres for part of its course. The water of the Chagres is used to operate the locks of the PANAMA CANAL (*q. v.*)

CHAILLÉ-LONG, CHARLES (shā/yā'lōn), an American explorer, born of French parentage, in Baltimore, Md., 1843. After serving in the Confederate army he went to Egypt, where he was appointed lieutenant-colonel by the Khedive (1870). Gordon made him chief-of-staff and sent him on a mission to King Mtesa of Uganda. From 1887 to 1889 he was secretary of legation and consul-general of the United States in Korea. In 1897 he was a member of the Postal Congress and in 1900 of the special commission to the Paris Exposition. He died in 1917. He wrote: "The Three Prophets" (1886); "Central Africa" (1887); "My Life in Four Continents" (1912).

CHALCEDON (käl-sē'don), a Greek city of ancient Bithynia, opposite Byzantium (Constantinople), at the entrance of the Black Sea, about 2 miles S. of the modern Scutari. It was a flourishing town when it came into possession of the Romans, under the testament of Nicomedes, 74 B. C., as included in the kingdom of Bithynia. It was finally de-

stroyed by the Turks, by whom it was taken, about 1075. In ecclesiastical history it is important as the place at which, in 451, Marcian held the general council for destroying the influence of Dioscuros and the Monophysites by formulating the belief in the existence of two natures in Christ.

CHALCIS (kal'sis), a Greek town, anciently the chief town of Eubœa, separated by the narrow strait of Euripus from the Boeotian coast, on the mainland of Greece, with which it was connected by a bridge. Chalcis, which is mentioned by Homer, early became one of the greatest of the Ionic cities, carrying on an extensive commerce, and planting numerous colonies in Syria, Macedonia, Italy, Sicily, and the islands of the Ægean Sea. It was subsequently a place of importance under the Romans. There is still a town on the site, consisting of an inner walled town and an outer suburb. Pop. about 17,500.

CHALCIS, a typical genus of a large family of Hymenopterous insects, not unlike small wasps. The family (*Chalcididae* or *Pteromalini*) has this great importance, that the larvæ of its members are parasitic in the eggs, larvæ, or pupæ of other insects, and as some of the latter are very destructive to plants, their parasites are animals to be thankful for. Thus forms so different as the cabbage butterfly and the destructive Hessian fly have their attendant *Pteromalini*. Many of the so-called gall-wasps (*Cynipidæ*) which cause many of the commonest galls—for instance, on the oak, or the curious bunches on rose and briar bushes—are preyed upon by *Chalcididae*. Some of the hosts of these Chalcidæ are themselves parasitic, and thus we have parasites within parasites, or double parasitism. Altogether over 2,000 species of *Chalcididae* are known.

CHALDÆA, in ancient geography the regions of Babylonia, or more generally Babylonia. The early history of Chaldæa as a separate kingdom is very uncertainly known. The Chaldæans were conquered by the Assyrians, with Babylon, and waged frequent wars with the latter power. When the Assyrian power began to wane, the Chaldæans, being a more warlike and powerful people than the Babylonians, became supreme; Chaldæa and Babylon, by their conquests under Nebuchadnezzar, became one kingdom, and the names Chaldæa and Babylonia became synonymous terms.

CHÂLET, the French-Swiss name for the wooden hut of the Swiss herdsmen

on the mountains; but is also extended to Swiss dwelling-houses generally, and to picturesques and ornate villas built in imitation of them.

CHALEUR BAY, or BAY OF CHALEURS (shäl'er'), an inlet of the Gulf of St. Lawrence, between Quebec and New Brunswick. The French fleet was here defeated by the British in 1760. There are a number of islands in this bay, notably Shippegan, near its mouth. The navigation is good and the mackerel fishery is important. The Restigouche river flows into the bay, as do numerous other large streams. Length from E. to W. 90 miles, and greatest breadth 20 miles. The bay is a great resort of fishermen, as its waters teem with many varieties of the finny tribe, including salmon. The bay, whose original name was Ecketam Nemauchi, or Bay of Fish, forms a single great harbor, destitute of shoals and reefs, and forming a safe refuge from storms and dangerous currents, as well as affording exceptionally safe anchorage.

CHALK, a well-known earthy limestone, of an opaque white color, soft, and admitting no polish. It is an impure carbonate of lime, and is used as an absorbent and anti-acid, and for making marks for various purposes, as on the blackboard in schools, and by artisans and others. Black chalk is a soft variety of argillaceous slate. Brown chalk, a familiar name for umber. Red chalk, another name for ruddle. French chalk, steatite or soap-stone, a soft magnesian mineral. Drawing chalks were originally restricted in colors to white, black, and red, but now chalks of every color are used, and are known by the name of crayons, commonly made of calcium sulphate and not the carbonate, as supposed. In geology chalk is the rock which forms the higher part of a series or group of strata, comprising rocks of different kinds, termed the cretaceous system.

CHALMERS, THOMAS, a Scotch clergyman, born in Anstruther, Fife, March 17, 1780. At the age of 12 he was sent from the parish school to the University of St. Andrews, and after studying there seven years, was licensed as a preacher in July, 1799. During the two following years he studied mathematics and chemistry in Edinburgh, and then became assistant professor of mathematics at St. Andrews. In 1803 he was presented to the parish of Kilmany, in Fife, where he made a high reputation as a preacher, which gradually spread throughout Scotland, and in 1815 he was inducted to the Tron Church of

Glasgow. His astronomical discourses delivered there in the following winter produced a sensation not only in the city but throughout the country, 20,000 copies selling in the first year of their publication.

It was while pastor of this church that he developed his scheme for the reorganization of the parochial system with a view to more efficient work among the destitute and outcast classes, his influence leading to a considerable extension of the means of popular instruction, both religious and secular. In 1819 he was transferred from the Tron to St. John's, a church built and endowed expressly for him by the Town Council of Glasgow, but his health having been tried by overwork he accepted, in 1823, the chair of moral philosophy at St. Andrews. In 1827 he was elected to the divinity chair in the University of Edinburgh, an appointment which he continued to hold till the Disruption from the Scottish Church in 1843. In 1832 he published his "Political Economy," and shortly afterward his "Bridgewater Treatise on the Adaptation of External Nature to the Moral and Intellectual Constitution of Man." During this period he was occupied with the subject of Church extension on the voluntary principle, but it was in the great non-intrusion movement in the Scottish Church that his name became most prominent.

Throughout the whole contest to the Disruption in 1843, he acted as the leader of the party that then separated from the Establishment, and may be regarded as the founder of the Free Church of Scotland, of the first assembly of which he was moderator. Having vacated his professional chair in the Edinburgh University, he was appointed principal and primarius professor of divinity in the new college of the Free Church. In addition to his duties in these posts, he continued in Edinburgh his zealous labors for the elevation of the "home-heathen," giving a practical exemplification of his schemes by the establishment of a successful mission in the West Port. He died in Morningside, Edinburgh, May 31, 1847.

CHÂLONS-SUR-MARNE (shäl-ôn' sûr-märn), the capital of the French department of Marne, on the Marne river, 107 miles E. of Paris. An old place, with timber houses and many spired churches, it has an interesting cathedral, dating chiefly from the 13th century, a handsome hôtel-de-ville (1772), and a fine public park, though the Germans cut down its immemorial elms for fuel. It still does a consider-

able trade in Champagne wine, but its manufacture of the worsted cloth known as "shalloon" (Chaucer's *chalons*) is a thing of the past and the population has dwindled from 60,000 in the 13th century to about 30,000. Near Châlons, which takes its name from the *Catalauni* of Latin writers, the Romans and Goths in 451 A. D. defeated Attila and his host of Huns. In 1856 Napoleon III. formed the celebrated camp of Châlons, 16½ miles to the N. E. of the town. Hence, during the Franco-Prussian war, on the night of Aug. 21, 1870, MacMahon withdrew his troops, and next day the town was occupied by the Germans. The town was again in the fighting area during the WORLD WAR (q. v.).

CHÂLONS-SUR-SAÔNE (-sôñ), ancient Cabillonum, a town in the French department of Saône-et-Loire, 84½ miles N. of Lyons. Lying on the right bank of the Saône, at the point where that river is joined by the Canal du Centre, uniting it with the Loire, Châlons has an extensive traffic with the central districts of France, as well as with the Mediterranean and Atlantic. Fine quays and houses line the river, and the chief building is the Church of St. Vincent, 14th to 15th century. The industries are copper and iron founding, machinery and shipbuilding, and the manufacture of glass, paper, hats, wine, chemicals, etc. It has a branch of the famous Creusot Engineering Works. Pop. about 32,000.

CHAMÆROPS (kam-î'-rops), a genus of plants belonging to the order *Palmaeæ*. The dwarf fan palm, so called from its low growth. It is the most northerly of the palm genera, and consists of 10 or 12 species. *C. humilis* extends as far N. as Nice, and the leaves of it are used for making hats, brooms, and baskets, and for thatching purposes. *C. fortunei*, a native of China, furnishes a coarse brown fiber used for hats and a waterproof cloth called So-e.

CHAMBERLAIN, an officer charged with the direction and management of the private apartments of a monarch or nobleman. The lord-chamberlain or lord-great-chamberlain of Great Britain is the sixth officer of the crown. His functions, always important, have varied in different reigns. Among them are the dressing and attending on the king at his coronation; the care of the palace of Westminster (Houses of Parliament), and attending upon peers at their creation, etc. The office of lord-chamberlain of the household is quite distinct from that of the great-cham-

berlain, and is charged with the administration. This officer has the control of all parts of the household (except the ladies of the queen's bed-chamber) which are not under the direction of the lord-steward, the groom of the stole, or the master of the horse. The king's (queen's) chaplains, physicians, surgeons, etc., as well as the royal tradesmen, are by his appointment; he is also the licenser of plays. He has under him a vice-chamberlain.

CHAMBERLAIN, (JOSEPH) AUSTEN, an English public official born in Birmingham in 1863, the son of the late Joseph Chamberlain. He was educated at Rugby and Trinity College, Cambridge, and at once entered official life. From 1895 to 1900 he was Civil Lord of the Admiralty, and from 1900 to 1902 was Financial Secretary of the Treasury. He was Postmaster-General in 1902-1913, and Chancellor of the Exchequer from 1903 to 1906. In 1913 he was appointed Chairman of the Royal Commission on Indian Finance and Currency. He was Secretary of State for India from 1915 to 1917, resigning in the latter year. From April, 1918, he was a member of the Coalition War Cabinet. He was appointed Chancellor of the Exchequer in January, 1919. He was successively elected to Parliament from East Worcestershire from 1892 to 1914, and from Birmingham, West, since 1914.

CHAMBERLAIN, BASIL HALL, an English Japanese scholar; born Southsea, Oct. 18, 1850. He devoted his life to the study of Japanese customs and literature and was professor of Japanese and philology at the Imperial University of Tokio. Among his publications were "The Classical Poetry of the Japanese" (1880); "Translation of the Kojiki" (1883); "A Romanized Japanese Reader" (1886); "Language, Mythology and Geographical Nomenclature of Japan in the Light of Aino Studies" (1887); "Luchuan Grammar" (1895); "Things Japanese" (1890); "Japanese Poetry" (1910).

CHAMBERLAIN, GEORGE EARLE, an American legislator, born near Natchez, Miss., Jan. 1, 1854. He graduated from Washington and Lee University in 1876. In December of that year he removed to Oregon, which he has since made his home. He taught school and practiced law until 1880, when he was elected to the State Legislature. He was appointed State Attorney-General in 1891 and was twice elected Governor, in 1902 and 1906. On Jan. 19, 1909, he was elected to the

United States Senate and re-elected in 1914. As chairman of the Senate Committee on Military Affairs he was an influential factor in the prosecution of the World War. Though a member of the Democratic party, his views on preparedness brought him into conflict with President Wilson.

CHAMBERLAIN, JOHN LOOMIS, an American army officer; born at New York, Jan. 20, 1858. He graduated from the United States Military Academy in 1880. In the Spanish-American War he served as major of the United States Volunteers with the Seventh Army Corps. He had five years' service in the Philippines. He was appointed Major-General Oct. 6, 1917. His later service was in the department of the Inspector-General, U. S. A., and, in his capacity as Inspector-General, he made a tour of inspection of the A. E. F. in France in 1918. He was awarded the D. S. M.

CHAMBERLAIN, JOSEPH, an English statesman, born in London in July,



JOSEPH CHAMBERLAIN

1836. He was educated at University College School, and entered his father's screw factory at Birmingham, from which, however, he retired in 1874. He

had by this time acquired considerable celebrity as a Radical politician. In 1868 he was appointed a member of the Birmingham town-council, was mayor of Birmingham from 1873 to 1876, and chairman of the Birmingham school-board from 1874 to 1876. After unsuccessfully contesting Sheffield against Mr. Roebuck in 1874, he was returned for Birmingham without opposition in June, 1876. He soon made his mark in Parliament, and on the return of the Liberals to power in 1880 he was appointed president of the Board of Trade, with a seat in the cabinet. To Mr. Chamberlain's exertions was due the passing of the Bankruptcy Bill, but his efforts to amend the merchant shipping acts were unsuccessful. Meanwhile his influence was increasing rapidly outside the House; he came to be regarded as the leader of the extreme Radical party. During the last hours of Mr. Gladstone's government he was understood to be opposed to the renewal of the Irish Crimes Act; and during the general election of 1886 he was most severe in his strictures on the moderate Liberals, and produced an "unauthorized" program (in opposition to that of Mr. Gladstone), which included the readjustment of taxation, free schools, and the creation of allotments by compulsory purchase. He was returned by the western division of Birmingham. On Feb. 1, 1886, he became president of the Local Government Board, but resigned on March 26, because of his strong objections to Mr. Gladstone's Home Rule measures for Ireland, and after the "Round Table" conference had failed to reunite the Liberal party he assumed an attitude of uncompromising hostility to his old leader's new policy, and was bitterly assailed by Home Rulers as a renegade. He became leader of the Liberal-Unionists when the Duke of Devonshire went to the Upper House. Lord Salisbury sent him to Washington as commissioner on the Canadian fishery dispute, and in 1895 he was made Colonial minister in the Unionist Cabinet. As such he had, besides sharing the responsibilities of his colleagues, to face the troubles in South Africa, and to cherish closer fellow-feeling with the Colonies, as by welcoming the colonial ministers and colonial troops to London at the queen's "Diamond Jubilee" (1897), and by concessions to Canadian commercial autonomy. He carried the Australian Federation measure in Parliament (1900), and later had to face opposition from within the Liberal party. In 1903 he brought forward proposals for a system of preferential tariffs with the Colonies and advocated the imposition of a tax on foreign goods. He resigned

from the Cabinet in 1903 in order to advocate these proposals. He reorganized the Liberal-Unionist party in 1904 as a tariff-reform party. The party was defeated in 1906, but Chamberlain was re-elected to the House of Commons. Ill health prevented active participation in politics after 1906, but he continued as a member of the House until 1914, in which year he died. In 1888 he was married to Mary, daughter of William C. Endicott, Secretary of War in President Cleveland's first administration.

CHAMBERLAIN, JOSHUA LAWRENCE, an American army officer and educator. He was born in Brewer, Me., Sept. 8, 1828; graduated at Bowdoin College in 1852, and entered the volunteer service of the Union in 1862, was promoted to the rank of Brigadier-General by General Grant, for bravery at Petersburg, 1864; became a Major-General in 1865, and received the colors of Lee's army on its surrender. He was six times wounded. After the war he returned to the professorship at Bowdoin College which he had previously held. In 1867-1871 was governor of Maine, and in 1871-1883 was president of Bowdoin, resigning to engage in business in Portland, Me. He died in 1914.

CHAMBER OF COMMERCE OF THE UNITED STATES, an organization formed in 1912 for the purpose of encouraging trade and commercial intercourse between the States, Territories, and insular possessions of the United States, and with foreign nations. Its aim is to coördinate into an effective national body the various civic, commercial, and trade organizations of the country, and to increase their efficiency and extend their usefulness. Its membership includes business men and commercial associations in all States of the Union and the possessions of the United States, and includes also American Chambers of Commerce in Great Britain, Germany, France, Turkey, China, Brazil, Belgium, Mexico, and Spain. National headquarters are maintained in Washington. Its departments include the Research Department, Organization Service Department, and Field Department. An official organ, entitled "The Nation's Business," is published monthly.

CHAMBERS, (CHARLES) HADDON, an English playwright, born at Stanmore, New South Wales, in 1860. He was educated in the public schools of Sydney, Australia, and privately. He was engaged for several years in the Civil Service of New South Wales and was later a stockrider. In 1882 he removed to England and engaged in jour-

nalism. He developed marked talent as a writer of plays and many of his productions were given successfully in England and the United States. They include "Captain Swift"; "John a' Dreams"; "The Tyranny of Tears"; "The Impossible Woman," and "The Days of the Duke."

CHAMBERS, ROBERT WILLIAM, an American artist and novelist, born in Long Island, N. Y., 1865. He was one of the most prolific writers of fiction. Much of his work appeared in magazines. He wrote: "The King in Yellow"; "The Red Republic"; "A King and a Few Dukes"; "Cardigan"; "Lorraine"; "The Fighting Chance"; "The Firing Line"; "The Green Mouse"; "Streets of Ascalon"; "The Girl Philippa"; "The Restless Sex"; "The Crimson Tide," etc.

CHAMBERS, WILLIAM, a Scotch prosewriter and editor, brother and partner of Robert, born in Peebles, April 16, 1800. He wrote "Things as They Are in America" (1854); "American Slavery and Color" (1857); "France, its History and Revolutions" (1871); "Stories of Old Families and Remarkable Persons" (1878). He also compiled a "Hand Book of American Literature" (1857). He died in Edinburgh, May 20, 1883.

CHAMBERSBURG, a borough and county-seat of Franklin co., Pa., on the Conococheague and Falling Creeks and the Cumberland Valley and Western Maryland railroads, 52 miles W. S. W. of Harrisburg. In Early's raid in the Civil War General McCausland entered Chambersburg with Confederate cavalry, July 30, 1864, and demanded a tribute of \$200,000 gold; this not being paid, the place was set on fire and two-thirds of it burned, causing a loss of \$1,000,000. It was soon rebuilt, chiefly of brick or stone, and is now the seat of Wilson College, for women, and has an academy, several churches, and newspapers, public schools, manufactories, machine shops, National banks, etc. Pop. (1910) 11,800; (1920) 13,171.

CHAMBÉRY (shäm-bä'rē'), capital of the former duchy and present French department of Savoie, beautifully situated between two ridges of hills, amid gardens and country-seats, 370 miles S. E. of Paris. The scenery around, with the river Laisse flowing through the valley, is exceedingly fine. The town itself, however, is dull and uninteresting, with narrow and gloomy streets winding between high, well-built houses. Notable edifices are the small cathedral, the palace of justice, and the old castle of the Dukes of Savoie, restored early

in the 19th century. Chambéry has manufactures of clocks, silk-gauze, soap, hats, paper, and a trade in silk, wine, coal, etc. Pop. about 25,000.

CHAMBORD (shän-bör'), a castle, park, and village, near Blois, department of Loir-et-Cher, in France. The splendid castle, in the Renaissance style, was mainly built by Francis I., being begun in 1526, and was completed under Louis XIV. In 1745 it was given by Louis XV. to Marshal Saxe, who died there in 1750. Napoleon gave it to Berthier, and in 1821 a company of Legitimists bought it and gave it to the Duke of Bordeaux, in name of the people of France.

CHAMELEON, the animal known to naturalists as *Chamæleon africanus*. Owing to the *rete mucosum* containing two kinds of coloring matter, the animal frequently changes color to the eye of the observer, a property which has rendered it an object of curiosity in all ages. It



CHAMELEON

was anciently fabled to live on air. It has but five cervical vertebræ. The hind as well as fore toes are five; trunk mounted high on the legs, forming an exception to the majority of reptiles; lungs very large; tongue cylindrical, extensible, and retractile, terminating in a dilated and tubular tip covered with a glutinous secretion, by means of which the animal catches its food of insects, flies, etc. Reproduction is by means of eggs.

CHAMINADE, CÉCILE LOUISE STÉPHANIE, a French composer, born in Paris in 1861. She studied music in Paris and made several successful recital tours in England and the United States. She wrote many pieces of music which had high merit. These include a dramatic symphony, "Trios," and a large number of works for piano and violin, besides many songs.

CHAMISSE, ADELBERT DE (shä-mis'ō), a German poet, born at the castle

of Boncourt, in Champagne, France, Jan. 30, 1781. His family being driven to Berlin by the Revolution, he became, from 1796 to 1798, page to the queen-mother, and afterward entered the Prussian service, where he remained till 1808. He then revisited France; but shortly after returned to Prussia, and for three years devoted himself to the study of natural science at Berlin. In 1815 he accompanied as naturalist an expedition for the discovery of the Northwest Passage, and on his return took up his residence at Berlin, where he was appointed superintendent of the botanic garden. He wrote several works on natural history and botany, and an account of his voyage, but his reputation as a naturalist has been somewhat eclipsed by that which he acquired as a poet. In 1804-1806, in concert with Varnhagen von Ense, he published a collection of poems, under the name of the "Muses' Almanac," and in 1813 appeared his famous tale, "Peter Schlemihl, or the Shadowless Man," the plot suggested by a casual question of Fouqué's. Many of his ballads and songs are masterpieces in their way and still maintain their popularity. He died in Berlin in 1838.

CHAMOIS (sham'wā), an antelope, *Rupicapra tragus*, formerly called *Antelope Rupicapra*. It is the only antelope found wild in Europe, and in physical character it is somewhat aberrant, ap-



CHAMOIS

proaching the sheep and goats. It is about 3 feet 3 inches high, with two parallel horns 6 or 7 inches long, and no beard. It is densely clothed with hair. It is found on high mountain ranges,

especially on the Alps, the Pyrenees, the Carpathian mountains, and those of Greece.

CHAMOIS LEATHER, a leather made from the skin of the Chamois (*Rupicapra tragus*), but the skins of sheep, goats, deer, calves, and the split hides of other animals, are also used for making this kind of leather; the superior kinds of which are called chamois, and the inferior, wash-leather.

CHAMOMILE or **CAMOMILE** (kam'-ō-mil'; *Anthēmis nobilis*), a well-known plant belonging to the natural order *Compositae*. It is perennial, and has slender, trailing, hairy, and branched stems. The flower is white, with a yellow center. Both leaves and flowers are bitter and aromatic. The fragrance is due to the presence of an essential oil, called oil of chamomile, of a light blue color when first extracted, and used in the preparation of certain medicines. It is cultivated in gardens in the United States, and also found wild.

CHAMOUNI, or **CHAMONIX** (sha-mō'-nē), a celebrated valley in France, department Haute-Savoie, in the Pennine Alps, over 3,000 feet above sea-level. It is about 12 miles long, by 1 to 6 miles broad, its E. side formed by Mount Blanc and other lofty mountains of the same range, and it is traversed by the Arve. The mountains on the E. side are always snow-clad, and from these proceed numerous glaciers, such as the Glacier de Bossons and the Mer de Glace. The village of Chamouni (pop. 1,500) is much frequented by tourists, and is one of the points from which they visit Mount Blanc.

CHAMPAGNE (shäm-pän'), an old province in the N. E. of France, bounded on the N. by Belgium, on the E. by Lorraine, on the S. by Burgundy, and on the W. by Ile-de-France and Picardy. It is now embraced in the departments of Ardennes, Marne, Haute-Marne, and Aube, and parts of Yonne, Aisne, and Seine-et-Marne. It is a rolling country of calcareous formation, and from the vineyards on its hills are produced the famous wines of Champagne. It formed part of ancient Gaul, became known as Campania in the 6th century, and was ruled by independent native counts from the 10th century until 1284, when it was united to the crown of France by the marriage of Joanna, heiress of Navarre and Champagne, to Philip IV. (the Fair). It was formally incorporated with France in 1361. During the 12th and 13th centuries its court was an important literary center, and the language employed there (*langue d'oïl*) became

that of the court of France. At this epoch lived the celebrated chroniclers Villehardouin and De Joinville, and the poets Chrestien de Troyes and Count Thibaut IV. On account of its frontier situation and natural conformation Champagne has been the scene of many military operations, notably during the campaigns of 1792 and 1814, in the Franco-Prussian War, and again in the World War.

CHAMPAGNE (from *Champagne*, in France, where it was originally made), a kind of brisk, sparkling wine. Champagnes are divided into four categories: Sparkling Granot, Ordinary Sparkling, Half Sparkling, and Tisane de Champagne, or they may be classed as still, sparkling, and semi-sparkling. They are either sweet or dry, according to the extent to which fermentation has been carried. In the manufacture of Champagne black grapes of the first quality are usually employed.

CHAMPAIGN, a city in Champaign co., Ill., on the Illinois Central, the Cleveland, Cincinnati, Chicago and St. Louis, and other railroads, 48 miles S. E. of Bloomington. It is the trade center of a very rich agricultural region, is the seat of the Burnham Athenaeum and Hospital, and has several banks, daily and weekly newspapers, etc. Pop. (1910) 12,421; (1920) 15,873.

CHAMP DE MARS (*shän-de-märs'*), a large, rectangular public place in PARIS (*q. v.*), on the left bank of the Seine.

CHAMPFLEURY (*shon-fle-rē'*) pseudonym of Jules Fleury-Husson, a French novelist born at Laon, Sept. 10, 1821. His story of "The Faience Violin" was a masterpiece of realistic description. He wrote an autobiographical novel of his youthful years in "The Confessions of Sylvius" (1849), continuing the story in "The Adventures of Mariette" (1856). But his "Burghers of Molinchart" (1855), a satiric delineation of the provincial bourgeoisie, made him famous. He is a pronounced "realist." He died at Sèvres, Dec. 5, 1889.

CHAMPION HILLS, a place in Hinds co., Miss., near Vicksburg, where, on May 16, 1863, a battle was fought between the Union army under General Grant and the Confederate under General Pemberton. The Confederate army was defeated and retreated to Big Black river, with a considerable loss of men and guns.

CHAMPLAIN, LAKE, a picturesque body of water occupying a basin between the Green and Adirondack mountains, on

the border of the States of Vermont and New York. Its length is about 125 miles, and its maximum depth is 280 feet. The waters find an outlet at the N. end, by the Richelieu or Sorel river, which empties into the St. Lawrence. Since the construction of the Champlain canal (1818-1823), which connects it with the Hudson river, the lake has become an important medium of commerce between Canada and the United States. During the wars between the United States and Great Britain, this body of water was the scene of numerous military operations. On Sept. 11, 1814, the American Commodore McDonough gained, under adverse circumstances, a most brilliant and thorough victory over the British fleet, near Plattsburg. This was one of the earliest substantial successes for the United States, in the War of 1812. The tercentenary of Lake Champlain's discovery was celebrated in 1909, French, British, and American representatives participating.

CHAMPLAIN, SAMUEL DE, a French navigator, colonizer, and soldier, born at Brouage, Saintonge, about 1570. In early life he served in the army of Henri IV., but in January, 1599, as commander of the ship "St. Julien," sailed to the West Indies, Mexico, and Panama.



SAMUEL DE CHAMPLAIN

On his return (1601) he prepared a record of this cruise, with charts, etc. In March, 1603, he sailed for North America in the ship of Pontgrave, and explored, by boat, the St. Lawrence river up to the Falls of St. Louis, and down to Gaspé. Returning to France he pub-

lished his "The Savages." In May, 1604, he sailed with De Monts along the shores of Nova Scotia, wintered on the island of St. Croix, and founded a colony at Port Royal. From 1604 to 1606 he made careful surveys and charts of the coast as far as Cape Cod. He revisited France in 1607, but sailed again in 1608, and founded Quebec, which, owing to the development of its fur-trade, rapidly increased in size. In 1609 he accompanied an Algonquin and Huron expedition against the Iroquois, and thereby discovered Lake Champlain, on the borders of which the Iroquois were defeated. From September, 1609, to March, 1610, he was engaged in bringing over French mechanics for his colony. He became lieutenant-governor of New France (Oct. 8, 1612); fortified Quebec (1620); but was compelled (1629) to surrender to an English fleet, and was taken to England. Released in 1632, he sailed again for New France, with three well-equipped vessels, and spent his last years in the government and development of the French colonies. He died in Quebec, Dec. 25, 1635.

CHAMPOILLION, JEAN FRANÇOIS (shān-pōl-yōñ'), a French scholar, celebrated for his discoveries in the department of Egyptian hieroglyphics, born in Figeac, Dec. 23, 1790. At an early age he devoted himself to the study of Hebrew, Arabic, Coptic, etc., and in 1809 became Professor of History at Grenoble. He soon, however, retired to Paris, where, with the aid of the trilingual inscription of the Rosetta Stone and the suggestions thrown out by Dr. Thomas Young, he at length discovered the key to the graphic system of the Egyptians, the three elements of which—figurative, ideographic, and alphabetic—he expounded before the Institute in a series of memoirs in 1823. These were published in 1824 at the expense of the state, under the title of "Hieroglyphic System of the Ancient Egyptians." He died in Paris, March 4, 1832.

CHAMPS-ÉLYSÉES (eshōn'zā-lē-zā'), [Fr. "Elysian Fields"], a place of public resort in Paris, which consists of an avenue and the gardens surrounding it. These extend from the Place de la Concorde to the Place de l'Etoile, a distance of $1\frac{1}{4}$ miles. It became the property of the crown in 1616 and was ceded to the city in 1828. Its lower end forms a park, flanked by the Palais de l'Elysée, and by the two Palais des Beaux-Arts.

CHANCEL, the E. end of a church, in which the altar is placed. It was formerly, and is even now in places, divided from the body of the church by a

screen or lattice-work, and is raised by steps above the level of the body of the church.

CHANCELLOR, in ancient times a petty officer stationed at the fence of bars or lattice-work in a law-court, to introduce such functionaries as were entitled to pass inside.

The Lord Chancellor of England was originally the king's chief secretary, to whom petitions were referred, whence he was called *referendarius*. This title subsequently gave place to chancellor, which first occurs, according to Selden, in English history about A. D. 920. Being generally an ecclesiastic, he became keeper of the king's conscience. Having to express the sovereign's views in cases appealed to him from the courts of law, he gradually acquired a great legal standing himself, and finally developed into the potent personage now denominated the Lord Chancellor, or more fully the Lord High Chancellor. He is now the highest judicial functionary in the kingdom; he is keeper of the great seal; he presides in the House of Lords, of which he is prolocutor; he is a cabinet minister and privy councillor; presides in what was the Court of Chancery (once spelled chancery), but is now the Chancery Division of the Supreme Court; appoints all justices of the peace throughout the kingdom; is the general guardian of all infants, idiots, and lunatics; visitor of the hospitals and colleges of royal foundation; and patron of all livings under a specified value. He goes out with the ministry of which he is a member.

The Chancellor of the Exchequer of England is, properly, the under-treasurer of the exchequer, the head treasurership being held, not by an individual, but by the Lords Commissioners of the Treasury. The chancellor has, however, a very powerful voice in connection with the exchequer. He must be in the House of Commons, and may be its leader, and also Prime Minister.

The Chancellor of the former German Empire was an officer, the extent of whose power and influence had never been exactly defined. In modern Germany since the unification of the German Empire the office was made illustrious by its association with the name of Bismarck, the first to hold that position under the new régime. In general terms it may be stated that the German Chancellor was an executive of very great powers, being at once the adviser and prime minister of the Emperor. He combined the functions of one of the American department secretaries with those of the promoter and originator of

political policy. The new constitution of the German republic provides that the Chancellor shall be appointed and dismissed by the President, and shall suggest to the latter the appointment or dismissal of the other cabinet ministers. The Chancellor, however, under the new constitution, needs the confidence of the Reichstag for the fulfilment of his office and must withdraw in the event that the Reichstag by explicit resolution withdraws its confidence. The Chancellor shall preside in the government administration and shall conduct its affairs in accordance with an order of business which shall be determined by the administration and approved by the President of the Republic. He shall determine the line of policy and shall assume responsibility therefore to the Reichstag.

CHANCELLORSVILLE, BATTLE OF, one of the great battles of the American Civil War, fought at Chancellorsville, Va., May 2 and 3, 1863. Gen. Joseph Hooker commanded the Federal force, and Gen. Robert E. Lee the Confederate force. Although Hooker's army was superior in numbers, being about 130,000 against 60,000 of the Confederates, the advantage at the end of the battle lay with the latter. During a flank movement the 11th corps of the Federal army, under Gen. O. O. Howard, was surprised and thrown into a panic near nightfall of the first day. The flank movement extended so far that the bullets of the Confederates were turned upon their own troops, and by their fire "Stonewall" Jackson was mortally wounded. The Federal loss was 18,000, the Confederate loss 13,000.

CHANCERY, in law, a court having special defined power. The English Court of Chancery was the highest court of judicature next to the House of Lords. The Lord Chancellor presided in this court, having under him the Lords Justices and Vice-Chancellors, who acted for him in separate courts, and the Master of the Rolls, who had the keeping of all the rolls and records of the Court of Chancery, and also presided in a court of his own. The Court of Chancery was a court of equity. Under the Judicature Act of 1873 the powers and jurisdiction of the Court of Chancery were transferred to the High Court of Justice, and it now exists as the chancery division of that court.

In the United States it is a court having equity jurisdiction. American courts of equity are, in some instances, distinct from those of law; in others, the same tribunals exercise the jurisdiction both

of courts of law and equity, though their forms of proceeding are different in their two capacities. The Supreme Court of the United States, and the Circuit Courts, are invested with general equity powers, and act either as courts of law or equity.

CHANDOS, a great English family, descended from a follower of William the Conqueror, the last representative in the direct male line being Sir John Chandos (died 1428), whose sister married one Giles Brydges. Their descendant, Sir John Brydges, was lieutenant of the Tower under Queen Mary, and was created Baron Chandos in 1554. James Brydges (1673-1744), eighth Lord Chandos, sat in Parliament for Hereford from 1698 to 1714, and was created Duke of Chandos in 1719. The lucrative post of paymaster of the forces abroad (1707-1712) supplied means for building a palace at Canons, near Edgeware, which cost £200,000, but was torn down at the duke's death. Here Handel lived two years, wrote anthems for the chapel service, and produced "Esther." In 1796 the title passed by marriage to the family of Grenville, the present dukes of Buckingham and Chandos. The third and last duke of this line died in 1889.

CHANG-CHOW-FOO, or **CHANG-CHAU**, a city of China, is about 36 miles S. W. of Amoy, which is its port. It lies in a valley in the province of Fu-Chien, and is surrounded by hills and intersected by a river. It is the center of the Fu-Chien silk industry, and has an extensive trade, both domestic and foreign, in sugar and tea. Pop. about 1,000,000.

CHANG-SHA, a city of China, capital of the province of Hu-Nan, on the Hang-Kiang, a tributary of the Yang-tse-Kiang. Chang-Sha has an important native trade, manufactures silk extensively. Pop. about 250,000.

CHANNEL ISLANDS, a group of islands in the English Channel, off the W. coast of department La Manche, in France. They belong to Great Britain, and consist of Jersey, Guernsey, Alderney, and Sark, with some dependent islets. They are almost exempt from taxation, and their inhabitants enjoy besides all the privileges of British subjects. The government is in the hands of bodies called the "states," some members of which are named by the crown, while others are chosen by the people, and others sit *ex officio*. The islands have been fortified at great expense. They form the only remains of the Norman provinces once subject to England. Area 75 square miles; pop. almost 100,000.

CHANNING, WILLIAM ELLERY, an American preacher and writer, born in Newport, R. I., April 7, 1780. He studied at Harvard College, became a decided Unitarian, and propagated Unitarian tenets with great zeal and success. His first appointment as a pastor was in 1803, when he obtained the charge of a congregation in Boston, and ere long he became known as one of the most popular preachers of America. His reputation was still further increased by the publication of writings, chiefly sermons, reviews, etc., on popular subjects. He died in Bennington, Vt., Oct. 2, 1842.

CHANNING, WILLIAM ELLERY, an American poet; nephew of William E. Channing, the elder; born in Boston, Mass., June 10, 1818. He is author of "Poems" (1843-1847); "The Woodman" (1849); "Near Home" (1858); "The Wanderer" (1872); "Conversations in Rome" (1847); and "Thoreau" (1873). He died in 1901.

CHANNING, WILLIAM HENRY, an American Unitarian clergyman and biographer; nephew of W. E. Channing, the elder; born in Boston, May 25, 1810. Settling in England, he succeeded James Martineau as pastor at Liverpool. His daughter married Sir Edwin Arnold. His principal work was "Memoir of William Ellery Channing" (3 vols., 1848). He died in London, Dec. 23, 1884.

CHANTIBUN, or CHANTABON, an important commercial port of Siam, near the mouth of the Chantibun river, in the Gulf of Siam. Pop. about 30,000.

CHANTILLY, (shān-tē-yē'), a town of France in the department of the Oise, 25 miles N. N. E. of Paris, celebrated for a variety of lace made here and in the neighborhood; for the splendid château, built by the great Condé, but leveled by the mob at the revolution; and also for another palace built by the Duc d'Aumale after the estate came into his possession in 1850, which, along with the fine domain, was presented by the duke to the French Institute in 1887. It is a horse-racing center. Pop. about 7,500.

CHANTREY, SIR FRANCIS, an English sculptor, born near Sheffield, April 7, 1781; was the son of a well-to-do carpenter. Even in boyhood his chief amusement was in drawing and modeling figures, and he was apprenticed in 1797 to a carver and gilder. In 1802 he commenced work for himself at Sheffield by taking portraits in crayons. After studying at the Royal Academy in London he eventually settled in the metropolis, where he presented numerous busts at the exhibitions of the Royal

Academy. He soon came to be regarded as the first monumental sculptor of his time. In 1816 he was chosen an associate and in 1818 a member of the Royal Academy. He was knighted in 1835. His most celebrated works are the "Sleeping Children," in Litchfield Cathedral; the statue of Lady Louisa Russell, in Woburn Abbey; the bronze statue of William Pitt, in Hanover Square, London; a statue of Washington, in the State House, Boston; and statues of Horner, Canning, Sir J. Malcolm, etc., in Westminster Abbey. His best works are his busts, but his full-length figures betray an insufficient acquaintance with anatomy, and several of his equestrian statues are still more defective. He died Nov. 25, 1842.

CHANUTE, a city of Kansas, in Neosho co. It is on the Atchison, Topeka and Santa Fé, and the Missouri, Kansas and Texas railroads. It has several industries of importance, including glass works, brick and cement plants, tool works, flour mills, oil refineries, etc. It is the center of an extensive oil and gas district. Pop. (1910) 9,272; (1920) 10,286.

CHAO-CHAU, a city of China, on the Han-Kiang, in the province of Kwang-tung, 195 miles N. E. of Hong-Kong. Although not a treaty port, Chao-Chau has a harbor for ordinary vessels of commerce. The nearest telegraph station is at Swatu, 20 miles away. Pop. about 200,000. The city is wholly under native control and sends large quantities of sugar and tea down the Han-Kiang to the treaty port of Swatu (or Swatow).

CHAPALA, a lake in Mexico, on the high plateau of Jalisco, surrounded by steep, bare mountains. It has an estimated area of 1300 square miles, contains many islands, and its outlet is the Rio Grande de Santiago.

CHAPEL, a place of worship, formerly distinguished from a church by the publicity of the worship to be performed; churches being for general use, and chapels (or little churches) for the special use of private individuals or particular households. From these the use of the term in Europe has been extended so as to include all religious edifices not of the established faith. There are also, in the Protestant as in the Roman Catholic churches, chapels of ease to parish churches, built for the accommodation of worshipers in populous or extensive parishes. In Roman Catholic churches, portions of the main building, dedicated to particular saints, in honor of whom a service is there performed, are called chapels.

CHAPLAIN, literally a person who is appointed to a chapel, as a clergyman not having a parish or similar charge, but connected with a court, the household of a nobleman, an army, a prison, a ship, or the like. Chaplains in the United States army rank as majors, captains, etc.; in the navy they have the rank of lieutenant, lieutenant-commander, commander, captain, according to length of service.

CAPLIN, CHARLES SPENCER, a moving-picture comedian, born near London, in 1888. His theatrical career began at the age of 7 years, and he filled many engagements in vaudeville theaters in London. His first success was gained in "A Night in an English Music Hall," in which he toured the United States. His work with moving-pictures began in 1914 and was immediately successful. He became the most popular comedian appearing in the moving-pictures, not only in the United States but throughout the world.

CAPMAN, FRANK MICHLER, an American ornithologist, born at Englewood, N. J., in 1864. He received an academic education. From 1887 to 1908 he was assistant curator of ornithology and mammalogy at the American Museum of Natural History, and was full curator from 1908. He carried on many expeditions and explorations in temperate and tropical America and was awarded many medals for his work in ornithology. Among his books are "Handbook of Birds of Eastern North America" (1895); "Bird Studies with a Camera" (1900); "The Economic Value of Birds to the State" (1903); "The Travels of Birds" (1916); "Our Winter Birds" (1918). He was also a frequent contributor to magazines.

CAPMAN, GEORGE, an English poet, the earliest, and perhaps the best, translator of Homer, born in 1557. He was educated at Oxford, and in 1576 proceeded to London; but little is known of his personal history. His translation of the "Iliad" was published in three separate portions in 1598, 1600, and 1603. In 1614 appeared his translation of the "Odyssey," followed in the same year by that of the "Battle of the Frogs and Mice," and the Homeric hymns. He also translated Hesiod's "Works and Days" and portions of various classic poets. He wrote numerous plays, almost all now forgotten, though containing some fine passages. He died in 1634.

CAPMAN, JOHN JAY, an American essayist, born in New York City in 1862. He graduated from Harvard in

1884 and, after studying law, was admitted to the bar in 1888, but ceased active practice in 1898. He was the author of many volumes of essays, including "Emerson and Other Essays" (1898); "Causes and Consequences" (1898); "Learning and Other Essays" (1911); and "Greek Genius" (1915), etc. He also wrote several plays, a tragedy in verse, and "Songs and Poems" (1919). He edited "The Letters of Victor Chapman, with Memoirs." His son, Victor, was one of the first American aviators killed in the World War.

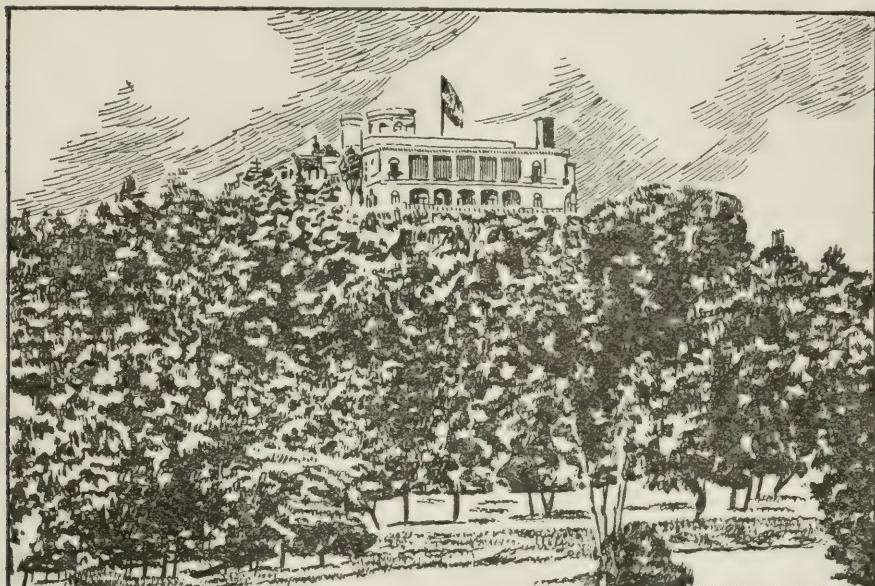
CAPMAN, J. WILBUR, an American clergyman and evangelist, born in Richmond, Ind., in 1859. He graduated from Lake Forest University in 1879 and from Lane Theological Seminary in 1882. In the latter year he was ordained Presbyterian minister. He served as pastor in Albany, N. Y., and Philadelphia, and in 1893 began evangelistic work, which he carried on with great activity in all parts of the United States. Among his published writings were "The Lost Crown"; "The Secret of a Happy Day"; "Present-Day Parables"; "Chapman's Pocket Sermons," and "When Home Is Heaven." He died in 1918.

CHAPULTEPEC, a rocky elevation about 3 miles S. W. of the City of Mexico. From this point at an early day water was brought in an aqueduct to the city, but no buildings were placed on it until about 1785, when the Viceroy of Mexico, Galvez, began the erection of a palace in the form of a fort, or castle, and intended for a stronghold as well as a residence. It was left unfinished until after the revolution. When the republic was formed, part of the building was used for a military school and the National Astronomical Observatory was erected on the hill. During the war with the United States, Gen. Pillow stormed the castle, Sept. 13, 1847. The Emperor Maximilian made Chapultepec his principal palace, and it is now occupied by the president, the portions used by the school and observatory, however, being still reserved for them. There is a beautiful park surrounding the hill, which is a favorite resort for the residents of the city.

CHARCOAL, an impure variety of carbon, prepared from vegetable substances or bones. Wood charcoal consists of wood burned with but little access of air. Billets of wood are built into a heap, which is covered with earth or sand. The heap is fired at openings left near the bottom of the pile, and the gases escape at small openings above.

For making fine charcoal, such as that of willow, used in the manufacture of gunpowder, the wood is burned in iron cylinders or rather retorts, in which a process of destructive distillation removes the volatile hydrocarbons, pyroligneous acid, etc. By this more perfect means the process is accurately regulated. Charcoal is used in the arts as a fuel; a polishing powder; a table on

CHARCOT, JEAN BAPTISTE ETIENNE AUGUSTE, a French explorer, born at Neuilly, France, in 1867. He was educated in Paris, where he later studied medicine and was attached to several important hospitals. In 1903 he began a series of Arctic explorations in the region of the South Pole, and his researches proved of great scientific value. His published writings include



CASTLE OF CHAPULTEPEC

which pieces of metal are secured in position to be soldered by the blowpipe; a filter; a defecator and decolorizer of solutions and water; an absorbent of gases and aqueous vapors; a nonconducting packing in ice-houses, safes, and refrigerators; an ingredient in gunpowder and fire-works; in the galvanic battery and the electric light.

Animal charcoal is used largely in sugar-refining, and as a disinfectant and filtering medium, is prepared by calcining bones in closed vessels. These are either retorts, similar to those in which coal is distilled for the production of illuminating gas, or they are earthenware pots, piled up in kilns and fired. Charges of 50 pounds of bones to a pot will require 16 hours of firing. The bones are then ground between fluted rollers, the dust removed, and the granulated material used for charging the filters of the sugar refiner. The material is used for removing color, feculencies, and fermenting ingredients from the syrup.

"France at the South Pole"; "Around the South Pole" and many scientific articles relating to his explorations.

CHARCOT, JEAN MARTIN (shär-kō'), a French physician, born in Paris, Nov. 29, 1825. His specialty was in the treatment of nervous and mental diseases, and he performed many curious and successful experiments in hypnotism and mental suggestion, in the Salpêtrière where he founded a clinic for the treatment of nervous diseases in 1880. He published several works treating of these subjects. He died Aug. 16, 1893.

CHARD, the leaves of artichoke covered with straw in order to blanch them and make them less bitter. Beet chards, the leaf stalks and midribs of a variety of white beet in which these parts are greatly developed, dressed for the table.

CHARENTE (shä-ränt'), a river in western France, rising in the department of Haute-Vienne, and falling into

the sea about 8 miles below Rochefort, opposite to the isle of Oleron, after a course of about 200 miles.

CHARENTE, an inland department of France, formed chiefly out of the ancient province of Angoumois and traversed by the river Charente; area, 2,305 square miles; capital, Angoulême (pop. about 39,000). Soil generally thin, dry, and arid; one-third devoted to tillage, a third to vineyards, and the remaining meadows, woods, and waste lands. The wines are of inferior quality, but they yield the best brandy in Europe, the celebrated cognac brandy being made in Cognac and other districts. Pop. about 350,000.

CHARENTE-INFÉRIEURE (an-fä-ri-eür), Lower Charente, a maritime province of France; area, 2,791 square miles. Surface in general flat; soil chalky and sandy, fertile, and well cultivated; a considerable portion planted with vines; salt marshes along the coast. The pastures are good, and well stocked with cattle, horses, and sheep. The wine is of common quality, and chiefly used for making brandy. Oysters and sardines abound on the coast. Salt and brandy are the only articles manufactured to any great extent. Capital, La Rochelle (pop. about 37,000). Pop. about 450,000.

CHARING CROSS, the titular center of London, so named from a cross which stood until 1647 at the village of Charing in memory of Eleanor, wife of Edward I. It is now a triangular piece of roadway near Trafalgar Square. The present copy was erected near the original site in 1865.

CHARIOT, in ancient times a kind of carriage used either for pleasure or in war. According to the Greeks, it was invented by Minerva: while Vergil ascribes the honor to Erichthonius, a mythical king of Athens, who is said to have appeared at the Panathenaic festival, founded by him, in a car drawn by four horses. The ancient Chariot had only two wheels, which revolved upon the axle, as in modern carriages. The pole was fixed at its lower extremity to the axle, and at the other end was attached to the yoke either by a pin or by ropes. The Greeks and Romans seem never to have used more than one pole, but the Lydians had carriages with two or three. In general the Chariot was drawn by two horses. Such was the Roman *biga*, but we also read of a *triga*, or three-horse Chariot, and a *quadriga*, or four-horse one.

CHARITY, SISTERS OF. See SISTERHOODS.

CHARIVARI (shär-ē-vär'-ē), an imitative word, having its origin in slang, describing a mock serenade of discordant music with such accompaniments as tin kettles, shouting, whistling, groaning, hissing, and screaming, and the like, meant for the annoyance and insult of an obnoxious person.

CHARLEMAGNE (shär-lē-mān'), Charles the Great, King of the Franks, and subsequently Emperor of the West, was born in 742, probably at Aix-la-Chapelle. His father was Pepin the Short, King of the Franks, son of Charles Martel. On the decease of his father, in 768, he was crowned king, and divided the kingdom of the Franks with his brother Carloman, at whose death in 771, Charlemagne made himself master of the whole empire, which embraced, besides France, a large part of Germany. His first great enterprise was the conquest of the Saxons, a heathen nation living between the Weser and the Elbe, which he undertook in 772; but it was not till 803 that they were finally subdued and brought to embrace Christianity. While he was combating the Saxons, Pope Adrian implored his assistance against Desiderius, king of the Lombards. Charlemagne immediately marched with his army to Italy, took Pavia, overthrew Desiderius, and was crowned King of Lombardy with the iron crown. In 778 he repaired to Spain to assist a Moorish prince, and while returning his troops were surprised in the valley of Roncesvalles by the Biscayans, and the rear-guard defeated; Roland, one of the most famous warriors of those times, fell in the battle. As his power increased, he meditated more seriously the accomplishment of the plan of his ancestor, Charles Martel, to restore the Western Empire. Having gone to Italy to assist the Pope, on Christmas day 800 he was crowned and proclaimed Caesar and Augustus by Leo III. His son Pepin, who had been made King of Italy, died in 810, and his death was followed the next year by that of Charles, his eldest son. Thus of his legitimate sons one only remained, Louis, King of Aquitania, whom Charlemagne adopted as his colleague in 813. He died Jan. 28, 814, in the 47th year of his reign, and was buried at Aix-la-Chapelle, his favorite and usual place of residence. Charlemagne was a friend of learning, and deserves the name of restorer of the sciences and teacher of his people. He attracted by his liberality the most distinguished scholars to his court (among others, Alcuin, from England), and established an academy in his palace at Aix-la-Chapell¹², the sittings of which he

attended with all the scientific and literary men of his court.

He invited teachers of language and mathematics from Italy to the principal cities of the empire, and founded schools of theology and the liberal sciences in the monasteries. He strove to cultivate his mind by intercourse with scholars; and, to the time of his death, this intercourse remained his favorite recreation.

mar, and several Latin poems. His empire comprehended France, most of Catalonia, Navarre, and Aragon; the Netherlands, Germany as far as the Elbe, Saale, and Eider, Upper and Middle Italy, Istria, and a part of Slavonia. In private life Charlemagne was exceedingly amiable; a good father and generous friend. In dress and habits he was plain and economical. In person he was



CHARLEMAGNE

His mother-tongue was a form of German, but he spoke several languages readily, especially the Latin, and was naturally eloquent. He sought to improve the liturgy and church music, and attempted unsuccessfully to introduce uniformity of measures and weights. He built a light-house at Boulogne, constructed several ports, encouraged agriculture, and enacted wise laws. He convened councils and parliaments, published capitularies, wrote many letters (some of which are still extant), a gram-

strong and of great stature. He was succeeded by his son Louis (*le Débonnaire*).

CHARLEROI, a borough of Pennsylvania, in Washington co. It is on the Monongahela river, and on the Pennsylvania railroad. Its industries, which are important, include mining and the manufacturing of glass and shovels. Pop. (1910) 9,615: (1920) 11,516.

CHARLEROI (shär-lér-wä'), a fortified and important manufacturing town of

Belgium, in the province of Hainault, on the navigable river Sambre, 33 miles S. of Brussels. The town is the center of the large coal-basin of Charleroi, and its chief manufactures are iron, glass, fire-arms, cutlery, slates, woolens, leather, tobacco, sugar, soap, rope, etc. The fortress of Charleroi was built in 1666 and named after Charles II. of Spain. The town has sustained several memorable sieges, and been successively possessed by the Spaniards, Austrians, and French. It felt the fury of the German invasion in the first year of the World War. The town was held by a combined force of French and British, the former commanded by General Lanrezac and the latter by General French. The Second German army under Von Buelow attacked the town on Aug. 21, 1914. Fierce street fighting ensued, first one side and then the other being driven from the town, but stubbornly returning to renew the fight. On the 22d, the enemy was re-enforced by another army under Von Hausen, and the French being heavily outnumbered, were forced to withdraw. The town remained in the hands of the Germans until the latter were driven out of Belgium in the victorious Allied drive in the fall of 1918. Pop. about 29,000.

CHARLES, the name of a number of European sovereigns and princes, were noted in the order of their respective countries, viz.:

CHARLES I., the second son of James I. of England, and VI. of Scotland, born in 1600. The death of his elder brother, Henry, Prince of Wales, in 1612, opened for him the succession to the throne. He received an excellent education, and was of a gentle and serious, but weak and obstinate disposition. In 1623, he, accompanied by his friend and favorite, the Duke of Buckingham, undertook a journey incognito to Madrid, in quest of the hand of a Spanish princess. This match being broken off through the artifices of Buckingham, Charles, in 1625, espoused Henrietta Maria, daughter of Henry IV. of France, and the same year he succeeded his father to the throne. Charles was a man thoroughly inoculated with the dictum of the "divine right of kings," and speedily brought himself into collision with the growing intelligence of the age he lived in. Under the advice of bad ministers, as Strafford, Laud, and Buckingham, he adopted tyrannous measures for the support of the royal authority against the progressing power of the people as represented by the lower house of Parliament. The levying of unjust taxes, and the adoption of illegal modes of raising money

supplies, soon precipitated the inevitable collision between the crown and the constitution. After dissolving two Parliaments, Charles summoned a third in 1628, which voted the king £280,000, but refused to pass this vote into law, until the king gave his solemn assent to the Petition of Rights—the second charter of English liberties, as it has been termed—by which he bound himself to abstain from forced loans and other illegal taxes, and from arbitrary imprisonments, and the billeting of soldiers upon the people. Charles, after subscribing to this covenant, violated his promise, and finding that the Commons were determined to vindicate their rights, dissolved Parliament on the 10th of March, and committed five of its members to prison for contumacy. Charles now de-



CHARLES I.

terminated to govern alone by calling no more Parliaments; and ship-money was for the first time levied from the inland counties. At length the king and his advisers provoked an open revolt in Scotland by forcing a liturgy (a thing Presbyterians abhorred) upon her people; whereupon they abolished episcopacy, kept up a determined front, and Charles in vain determined to coerce them. Under these circumstances, he, in 1640, assembled a new Parliament, the members of which were moderate men, but still men who were indisposed to countenance his arbitrary proceedings. He accord-

ingly dissolved that body, and was compelled to come to a truce with the Scots, who had entered the N. of England in force. The houses met again in the same year, brought in a bill of attainder against Strafford and had him executed; imprisoned Laud, abolished the Star Chamber and High Court of Commission, and curbed the royal prerogative in other important matters. Things now went on from bad to worse, and both parties had become so thoroughly embittered and disgusted that no other course was left but a final arbitrament by the sword. The king raised the royal standard at Nottingham in August, 1642, and to it flocked the majority of the nobility, gentry, and yeomanry of the land; the Parliament troops, on the other hand, being composed of the citizens of towns and the artisans of London. The battle of Marston Moor was the first signal blow inflicted on the royal cause. The hotly disputed battle fought at Naseby, in Northamptonshire, June 14, 1645, was that which decided the fate of Charles. Six months after this decisive defeat, Charles, tempted by his evil genius, withdrew to Scotland, a country in which his name was held in odium, owing to the persecutions of Laud; where, throwing himself upon the more than doubtful fidelity of Lord Leven, the Scottish general, and his army, he was delivered up by the Scots to the English Parliament upon payment of £400,000. The fallen monarch was first confined by the parliamentary commissioners in Holmby House, Northamptonshire. Here he was seized by the army (which had now disengaged itself from the Parliament), or, in other words, by Cromwell, and removed to Hampton Court, whence, after a futile attempt to escape, he was taken to Carisbrooke Castle, in the Isle of Wight. Here he carried on negotiations with the Parliament, who were willing to restore him under certain conditions, in order thus to overrule and break down the ascendant military power. But Cromwell, anticipating them, again seized the king's person, had him conveyed to Hurst Castle, near Lymington, Hampshire; and then, clearing out and crushing Parliament by "Pride's purge," prepared for the closing act of the great drama by having the captive sovereign brought to London, and put upon his trial before a High Court of Justice appointed for the occasion, on the charge that it was treason in a king to levy war against his Parliament. This trial began on Jan. 20, 1649, and lasted during four sittings. Sentence of death was pronounced upon him. Charles was executed Jan. 30, 1649, in the 49th year of his age, and the 24th of his reign.

CHARLES II., born in 1630, was called to the throne by a people sickened of civil broils and entered London May 29, 1660, his birthday, amid universal rejoicing. He is known as the Merry Monarch. The trial, condemnation, and execution of the "regicides," as they were called, or of so many then living as had been most active in the death of his father, was one of the first of the many mournful features of his reign. Next, the Act of Conformity ejected about 2,000 conscientious clergymen from their cures. The Dutch war followed, which began gloriously, but ended by their fleet, under De Ruyter, appearing in the Thames, sailing up the Medway, taking Sheerness, burning several ships, and insulting Harwich. A ministry known as the Cabal, which urged the king to repeat the errors of his father by exalting his prerogative above the privileges of parliament and the laws of the land, brought the country into thorough contempt in the eyes of Europe. His reign was one of the most corrupt and licentious of modern times, and can only compare in history with that of Louis XV. of France. Charles died in 1685, in the 55th year of his age, and the 25th of his reign. He left no legitimate issue.

CHARLES EDWARD (PRINCE). See STUART FAMILY, THE.

CHARLES I., surnamed *le Chauve*, or the Bald, King of France, son of Louis le Débonnaire, born in 823. After his father's death in 840 he fought with his half-brother Lothaire for the empire of the Franks, and finally acquired by the Treaty of Verdun (843) all those territories between the ocean on the one part, and the Meuse, the Scheldt, the Saône, the Rhone, and the Mediterranean, on the other. But he lost southern Aquitaine to his nephew Pepin, and had to divide Lorraine with his brother Louis the German. In 875 he was crowned emperor by Pope John VIII. He died in 877.

CHARLES II., surnamed *le Gros*, or the Fat, King of France, also known as Charles III., Emperor of Germany, born about 832. He was the son of Louis the German, and ascended the French throne in 885 to the prejudice of his cousin, Charles the Simple, but was deposed in 887 and died the following year.

CHARLES III., King of France, surnamed the Simple, son of Louis the Stammerer, born in 879. His reign is noted for his long struggle with the piratical Northmen or Normans, to whose chief, Rollo, he eventually ceded the territory of Normandy. He died in 929.

CHARLES IV., King of France, surnamed *le Bel*, or the Handsome, third son of Philippe le Bel, born in 1294, and ascended the throne in 1322. He died in 1328, without male issue, and was the last of the direct line descended from Hugh Capet.

CHARLES V., surnamed the Wise, King of France, son of King John, born in 1337. His father being taken prisoner by the English at Poitiers, the management of the kingdom devolved on him at an early age. With great skill and energy, not free, however, from duplicity, he suppressed the revolt of the Parisians and a rising of the peasants, kept the King of Navarre at bay, and deprived the English of a great part of their dominion in France. He erected the Bastille for the purpose of overawing the Parisians. He died in 1380.

CHARLES VI., surnamed the Silly, King of France, son of the foregoing, born at Paris in 1368, and in 1388 assumed the government. Four years later he lost his reason, and one of the most disastrous periods of French history followed. The kingdom was torn by the rival factions of Burgundians and Armagnacs (Orleanists). In 1415 Henry V. of England crossed over to Normandy, took Harfleur by storm, won the famous victory of Agincourt, and compelled the crazy king to acknowledge him as his successor. Charles died in 1422.

CHARLES VII., King of France, born in Paris in 1403. He succeeded only to the southern provinces of the kingdom, Henry VI. of England being proclaimed King of France at Paris. The English dominion in France was under the government of the Duke of Bedford, and so skillfully did the English general conduct his operations that Charles had almost abandoned the struggle as hopeless, when the appearance of Jeanne d'Arc, the Maid of Orleans, gave a favorable turn to his affairs, and the struggle ended in the expulsion of the English from all their possessions in France, except Calais. Charles died in 1461.

CHARLES VIII., King of France, son of Louis XI., born in 1470, succeeded his father in 1483. In 1491 he married Anne, the heiress of Brittany, and thereby annexed that important duchy to the French crown. The chief event in the reign of Charles VIII. is his expedition into Italy, and rapid conquest of the kingdom of Naples, a conquest as rapidly lost when a few months later Gonsalvo de Cordova re-annexed it to Spain. Charles was meditating a renewed descent into Italy when he died in 1498.

CHARLES IX., King of France, son of Henry II. and Catharine de' Medici, born in 1550, ascended the throne at the age of 10 years. His haughty and ambitious mother seized the control of the state. Along with the Guises she headed the Catholic League against the Calvinists, and her tortuous and unscrupulous policy helped to embitter the religious strife of the factions. After a series of Huguenot persecutions and civil wars a peace was made in 1570, which, two years later, on Aug. 24, 1572, was treacherously broken by the Massacre of St. Bartholomew. The king, who had been little more than the tool of his scheming mother, died two years afterward, in 1574.

CHARLES X., King of France, Comte d'Artois, grandson of Louis XV., the youngest son of the dauphin, and brother of Louis XVI., born in Versailles in 1757. He left France in 1789, after the first popular insurrection and destruction of the Bastille, and afterward assuming the command of a body of emigrants, acted in concert with the Austrian and Prussian armies on the Rhine. Despairing of success he retired to Great Britain and resided for several years in the palace of Holyrood at Edinburgh. He entered France at the Restoration, and in 1824 succeeded his brother, Louis XVIII. as king. In a short time his reactionary policy brought him into conflict with the popular party, and in 1830 a revolution drove him from the throne. He died in 1836. His grandson, the Comte de Chambord, claimed the French throne as his heir.

CHARLES, King of Germany. See CHARLEMAGNE.

CHARLES II., King of Germany. See CHARLES I. of France.

CHARLES III., surnamed Le Gros, Emperor of Germany. See CHARLES II. of France.

CHARLES IV., son of John of Luxembourg, King of Bohemia, elected Emperor of Germany at the death of Louis of Bavaria in 1346. He resided at Prague, and the most important event of his reign was the issuing of the "golden bull" in 1355, which defined the respective rights of the electors and the emperor. He died in 1378.

CHARLES V., Emperor of Germany and King of Spain (in the latter capacity he is called Charles I.), the eldest son of Philip, archduke of Austria, and of Joanna, the daughter of Ferdinand and Isabella of Spain, born in Ghent, Feb. 24, 1500. Charles was the grandson of the Emperor Maximilian and Mary,

daughter of Charles the Bold, last duke of Burgundy, and inherited from his grandparents on both sides Aragon, Naples, Sicily, Sardinia, Castile, and the colonies in the New World, Austria, Burgundy, and the Netherlands. On the death of Ferdinand, his grandfather, Charles assumed the title of King of Spain. In 1519 he was elected emperor, and was crowned at Aix-la-Chapelle with extraordinary splendor. The progress of the Reformation in Germany demanded the care of the new emperor, who held a diet at Worms. Luther, who appeared at this diet with a safe-conduct from Charles, defended his cause with energy and boldness. The emperor kept silent; but after Luther's departure a severe edict appeared against him in the name of Charles, who thought it his interest to declare himself the defender of the Roman Church. A war with France, which the rival claims of Francis I. in Italy, the Netherlands, and Navarre made inevitable, broke out in 1521. Neither side had a decided success till the battle of Pavia in 1525, where Francis was totally defeated and taken prisoner. Charles treated his captive with respect, but with great rigor as regarded the conditions of his release. A league of Italian states, headed by Pope Clement VII., was now formed against the overgrown power of Charles, but their ill-directed efforts had no success. Rome itself was stormed and pillaged by the troops of the Constable of Bourbon, and the Pope made prisoner. Nor was the alliance of Henry VIII. of England with Francis against the emperor any more successful, the war ending in a treaty (Cambray, 1529), of which the conditions were favorable to Charles. A war against the Turks by which Solyman was compelled to retreat, and an expedition against the Dey of Tunis by which 20,000 Christian slaves were released, added to the influence of Charles, and acquired for him the reputation of a chivalrous defender of the faith. In 1537 he made truce with Francis, and soon after, while on his way to the Netherlands, spent six days at the court of the latter in Paris. In 1541 another expedition against the African Moors, by which Charles hoped to crown his reputation, was unsuccessful, and he lost a part of his fleet and army before Algiers without gaining any advantage. A new war with France arose regarding the territory of Milan. The quarrel was patched up by the peace of Crespy in 1545. The religious strife was again disturbing the emperor. Charles, who was no bigot, sought to reconcile the two parties, and with this view alternately

courted and threatened the Protestants. At length in 1546 the Protestant princes declared war, but were driven from the field and compelled to submit. But the defection of his ally, Maurice of Saxony, whom Charles had invested with the electoral dignity, again turned the tide in favor of the Protestants. Maurice surprised the imperial camp at Innsbruck in the middle of a stormy night, and Charles with great difficulty escaped alone in a litter. The Treaty of Passau was dictated by the Protestants. It gave them equal rights with the Catholics, and was confirmed three years later by the diet of Augsburg (1555). Foiled in his schemes and dejected with repeated failures, Charles resolved to resign the imperial dignity, and transfer his hereditary estates to his son Philip. In 1555 he conferred on him the sovereignty of the Netherlands, and on Jan. 15, 1556, that of Spain, retiring himself to a residence beside the monastery of Yuste in Estremadura, where he amused himself by mechanical labors and the cultivation of a garden. He died Sept. 21, 1558.

CHARLES VI., born in 1685, second son of Leopold I., and was destined by his father to the crown of Spain. On the death of Charles II. in that country, his testamentary heir, the Duke d'Anjou, assumed the sovereignty under the title of Philip V.; and Charles VI., aided by England, Holland, and Portugal, was engaged in a protracted and fluctuating struggle with that prince (known in history as the War of the Spanish Succession), when the death of his brother Joseph I. called him to the imperial throne, in 1711, to which he added the crown of Hungary in the following year. The peace of Utrecht, in 1713, secured to his rival in Spain the rule of that country, and left Charles VI. to employ his famous general, Prince Eugene, for the defense of Venice against the Turks. Subsequent wars, consequent on the disputed succession in Poland, involved the loss of considerable territory, and, at the peace of Belgrade, in 1739, Charles VI. was compelled to cede Serbia and Wallachia to Turkey. He died in 1740.

CHARLES VII., born in 1697, the eldest son of Maximilian Emanuel, Elector of Bavaria, and was crowned emperor of Germany in 1742. During the three succeeding years, that country was the scene of one hot and continuous contest, known in history as the War of the Austrian Succession, in which Charles VII., who owed his crown to the intrigues and influence of his allies, France and Prussia, had to defend its possession against the legitimate claim of Maria

Theresa, Queen of Hungary. He died in 1745.

CHARLES I. (IV. IN HUNGARY) former Emperor of Austria and King of Hungary; born Aug. 17, 1887. He was grandson of the Archduke Karl Ludwig, and son of the Archduke Otto Franz Josef. On the death of his great-uncle, Franz Josef I., he succeeded to the throne, Nov. 21, 1916. He was of an amiable disposition, but lacked the qualities of a great ruler. His heart was never in the war, and there is little doubt that he would have liked to withdraw from it at any time after his accession. His wife was Empress Zita, a princess of Bourbon and Parma, whose sympathies were naturally with Italy, and it was largely to her influence that the lukewarmness of Charles was attributed. A great sensation was created in 1917 by the publication of the "Dear Sixtus" letter, which had been sent by Charles in his own handwriting to his brother-in-law, Prince Sixtus of Bourbon, in which the emperor referred to "France's just claims to Alsace-Lorraine." Attempts were made to show that the letter was a forgery, but the evidence was irrefutable, and Charles finally admitted that he was the author. Great tension was created between the courts of Berlin and Vienna by the incident, and Charles was compelled to atone for his indiscretion by writing another letter to the German emperor, in which he reiterated his firm adherence to the military plans of Germany. The relatives of Empress Zita were banished from Vienna and the Austrian armies were placed more fully than before under German leadership. Immediately after the collapse of the Central Powers and the signing of the armistice, Charles abdicated, and removed with his family to the stronghold of Eckhartsau. Their safety being menaced there, the royal family fled to Switzerland.

CHARLES LOUIS, (Archduke of Austria), third son of the Emperor Leopold II., and one of the first generals of his time, born in 1771. Appointed to an important military command, in 1796, he defeated the French generals Jourdan and Moreau, and in 1799 again defeated Jourdan in Suabia, and Marshal Massena at Zürich, and again, in 1805, at Caldiero. In 1809 he defeated the French under Napoleon at the bloody battle of Aspern and Esslingen (March 21-22), but was himself defeated at the decisive battle of Wagram (July 5-6). He died in 1847.

CHARLES I. (D'ANJOU), King of Naples, the son of Louis VIII. of France, waged war on King Manfred of Sicily,

and having defeated him, seized on the Neapolitan crown in 1266. His cruelty and exacting rule raised such a spirit of anarchy, and induced such a detestation of the French name, that the Sicilians, headed by John de Procida, rose in arms on the eve before Easter-day, 1282, and slaughtered all the French in the town and neighborhood of Palermo, the signal for rising being the tolling of the vesper-bell; this tragedy is hence recorded in history as the "Sicilian Vespers." By this act the French were entirely expelled from the island, and Sicily lost to Charles I.'s crown. Charles died in 1285.

CHARLES I. King of Rumania; born in 1839; was the second son of Prince Charles Anthony of Hohenzollern-Sigmaringen. He was elected Prince of Rumania on April 20, 1866, and reigned as prince until 1881, and as king until his death, Oct. 10, 1914. His reign was characterized by wisdom and prudence, and signalized the entrance of Rumania as an important state in the family of nations. He introduced railways, established the national finances on a sound basis, and was foremost in every plan of commercial and national development. He showed himself a brilliant military leader at the siege of Plevna, in the Russo-Turkish War, 1877-1878. In November, 1869, he married Princess Elizabeth of Wied, who under the pen-name of "CARMEN SYLVA" (*g. v.*) showed herself possessed of marked poetic gifts. At the opening of the World War he kept his kingdom neutral, though by birth and tradition his natural sympathies were with the Hohenzollerns. He was succeeded by his nephew Ferdinand, Oct. 11, 1914.

CHARLES ALBERT, born in 1798, ascended the throne of Sardinia in 1831. Till 1848 he had devoted himself to the internal economy of his kingdom and welfare of his subjects, but in that year of revolution he at once declared for liberal principles, and heading the Italian movement, led his army into Lombardy to support the Venetians, Lombards, Modenese, and other states who had thrown off the Austrian tyranny. At first he was successful in several encounters, but suffering a signal defeat at the hands of Marshal Radetzky, his power rapidly declined, the battle of Novara deciding his political influence, and, after about a year of further hostilities, he abdicated in favor of his son, Victor Emanuel, and retiring to Portugal, died there in 1849.

CHARLES II., King of Spain, succeeded his father, Philip IV., in 1665. In this reign, Spain, which for nearly three

centuries had held the foremost rank in Europe as a great military nation, reached the highest point of its greatness, and began rapidly to decline both in influence and glory, but such was the prestige attached to its name and past history, that it had long become powerless before it ceased to be respected. Charles died in 1700, bequeathing his throne to the Duke d'Anjou, grandson of Louis XIV. of France, an act which led to the long and calamitous "War of the Spanish Succession."

CHARLES IV., King of Spain, born in Naples, in 1748. He succeeded his father, Charles III., in 1788, and was governed by Manuel Godoy, Prince of Peace, the lover of his wife, Maria Louisa of Parma, and an instrument of Napoleon I. In 1808 he abdicated in favor of his son Ferdinand, but Napoleon, having both father and son in his power at Bayonne, obliged Ferdinand to restore the crown to his father, who was, in his turn, persuaded to relinquish it to Napoleon. Charles died in Rome, in 1819.

CHARLES XII., King of Sweden, born in Stockholm, June 27, 1682, was declared of age by the estates on the death of his father, in 1697. To his jealous neighbors this seemed a favorable time to humble the pride of Sweden. Frederick IV. of Denmark, Augustus II. of Poland, and the Czar Peter I. of Russia concluded an alliance which resulted in war against Sweden. With the aid of an English and Dutch squadron the Danes were soon made to sign peace, but Augustus of Saxony and Poland, and the czar were still in the field. Rapidly transporting 20,000 men to Livonia, Charles stormed the czar's camp at Nerva, slaying 30,000 Russians and dispersing the rest, Nov. 30, 1700. Crossing the Dwina he then attacked the Saxons and gained a decisive victory. Following up this advantage he won the battle of Clissau, drove Augustus from Poland, had the crown of that country conferred on Stanislaus Leczinsky, and dictated the conditions of peace at Altranstädt in Saxony in 1706. In September, 1707, the Swedes left Saxony, Charles taking the shortest route to Moscow. At Smolensk he altered his plan, deviated to the Ukraine to gain the help of the Cossacks, and weakened his army very seriously by difficult marches through a district extremely cold and ill supplied with provisions. In this condition, Peter marched upon him with 70,000 men, and defeated him completely at Pultawa. Charles fled with a small guard and found refuge and an honorable reception at Bender, in the Turkish territory. Here he managed to

persuade the Porte to declare war against Russia. The armies met on the banks of the Pruth (July 1, 1711), and Peter seemed nearly ruined when his wife, Catharine, succeeded in bribing the grand vizier, and procured a peace in which the interests of Charles were neglected. The attempts of Charles to rekindle a war were vain, and after having spent some years at Bender he was forced by the Turkish government to leave. Arrived in his own country in 1714, he set about the measures necessary to defend the kingdom, and the fortunes of Sweden were beginning to assume a favorable aspect when he was slain by a cannonball as he was besieging Frederikshall, Nov. 30, 1718.

CHARLES XIII., King of Sweden, born in 1748, was the second son of King Adolphus Frederick. In the war with Russia, in 1788, he received the command of the fleet, and defeated the Russians in the Gulf of Finland. After the murder of his brother, Gustavus III., in 1792, he was placed at the head of the regency, and gained universal esteem in that position. The revolution of 1809 placed him on the throne at a very critical period, but his prudent conduct procured the union of Sweden with Norway, Nov. 4, 1814. He adopted as his successor Marshal Bernadotte, who became king on the death of Charles, Feb. 5, 1818.

CHARLES XIV., King of Sweden and Norway (1814-1844), originally Jean Baptiste Jules Bernadotte, born at Pau, France, Jan. 26, 1764, the son of a lawyer. He entered the French army in 1780 as a common soldier; became an ardent partisan of the Revolution, and fought his way up to the command of a division in 1794, and a marshal's baton in 1804. He distinguished himself greatly in the German campaigns in 1796 and the year after under the eye of his great chief himself in Italy. In 1799 he was minister of war, and for his conduct at Austerlitz was named in 1805 Prince of Pontecorvo. In the campaigns of 1806 he commanded the first army corps. After Jena he pursued the Prussians to Halle, cut off the reserve under the Prince of Württemberg, next pursued the redoubtable Blücher to Lübeck, and compelled him to surrender, Nov. 7. He received the command of the French troops in north Germany and Denmark, and led the Saxon troops at Wagram in the war against Austria. He had never been liked or trusted, however, by Napoleon, whose jealousy and dislike now became so apparent that Bernadotte left the army in disgust, and returned to Paris. He was afterward sent by the

ministerial council to oppose the British, who had landed at Walcheren, but meantime the breach between the emperor and him grew wider. In 1810 he was elected crown prince and heir to the throne of Sweden. Almost the only condition imposed on him was that of joining the Protestant Church. He changed his name to Charles John; and the health of the Swedish king, Charles XIII., failing in the following year, the government came almost entirely into his hands. He refused to comply with the demands of Napoleon, which were opposed to the interests of Sweden, particularly as to trade with Great Britain, and was soon involved in war with him. He took part in the great and final struggle of the allies with Napoleon at Leipsic, but showed much reluctance to join in the invasion of France, and was tardy in his progress southward. There seems good reason to believe that the French throne was within his own ambition, and that his disinclination to act against his native country was due as much to policy as to patriotism. He became King of Sweden on the death of Charles XIII., in 1818, and won for himself the character of a wise and good king. Education, agriculture, manufactures, commerce, and great public works, as well as the military strength of the kingdom, were promoted by his care. He died March 8, 1844, and was succeeded by his son Oscar.

CHARLES D'ORLÉANS (shär'l-dor-lä-än'), a French nobleman and poet, son of Louis d'Orléans, born May 26, 1391. He was the grandson of Charles V. of France, and the father of Louis XII. He was taken prisoner at Agincourt, and kept in captivity in England from 1415 to 1440, when he was ransomed. He wrote a number of lyrics while in prison and after his return to France. At Blois, where he held his court, he gathered together the chief French writers of his time, and took part with them in poetical tournaments, in one of which François Villon competed successfully. His light and graceful lyrics are the last flowering of the courtly poetry of the Middle Ages; they show no trace of the modern spirit which appears so strongly in the works of his contemporary, Villon. His favorite themes are love and the springtime; his favorite form is the rondel, with two rhymes, of which he is considered the chief master, as Villon is of the *ballade* and Voiture of the *rondeau*. He died in 1465.

CHARLES EDWARD STUART, called the PRETENDER, grandson of James II.,

King of England, son of James Edward and Clementina, daughter of Prince Sobieski, was born in Rome, Dec. 31, 1720. In 1742 he went to Paris and persuaded Louis XV. to assist him in an attempt to recover the throne of his ancestors. Fifteen thousand men were on the point of sailing from Dunkirk, when the English admiral, Norris, dispersed the whole fleet. Charles now determined to trust to his own exertions. Accompanied by seven officers he landed on the W. coast of Scotland, from a small ship called the "Doutelle." Many Lowland nobles and Highland chiefs went over to his party. With a small army thus formed he marched forward, captured Perth, then Edinburgh, Sept. 17, 1745, defeated an army of 4,000 British under Sir John Cope at Prestonpans, Sept. 22, and advancing obtained possession of Carlisle. He now caused his father to be proclaimed king, and himself regent of England; removed his headquarters to Manchester, and soon found himself within 100 miles of London, where many of his friends awaited his arrival. The rapid successes of the adventurer now caused a part of the British forces in Germany to be recalled. Want of support, disunion, and jealousy among the adherents of the house of Stuart, some errors, and the superior force opposed to him, compelled Prince Charles to retire in the beginning of 1746. The victory at Falkirk, Jan. 28, 1746, was his last. As a final attempt he risked the battle of Culloden against the Duke of Cumberland, April 16, 1746, in which his army was defeated and entirely dispersed. The prince now wandered about for a long time through the wilds of Scotland, often without food, and the price of £30,000 sterling was set upon his head. At length, on Sept. 20, 1746, five months after the defeat of Culloden, he escaped in a French frigate. He received a pension of 200,000 livres yearly from France, and of 12,000 doubloons from Spain. Forced to leave France by the terms of the Peace of Aix-la-Chapelle (1748), he went to Italy, and in 1772 married a princess of Stolberg-Gedern, from whom eight years later he was separated. He died Jan. 31, 1788, and was buried at Frascati. The funeral service was performed by his only surviving brother, the Cardinal of York, with whose death in 1807 the Stuart line ended.

CHARLES MARTEL, ruler of the Franks, was a son of Pepin Héristal. His father had governed as mayor of the palace under the weak Frankish kings with so much justice that he was enabled to make his office hereditary in

his family. Chilperic II., King of the Franks, refusing to acknowledge Charles Martel as mayor of the palace, the latter deposed him, and set Clothaire IV. in his place. After the death of Clothaire he restored Chilperic, and subsequently placed Thierri on the throne. Charles Martel rendered his rule famous by the great victory which he gained in October, 732, over the Saracens, near Tours, from which he acquired the name of Martel, signifying hammer. He died in 741. Charlemagne was his grandson.

CHARLES THE BOLD, Duke of Burgundy, son of Philip the Good and Isabella of Portugal, was born at Dijon, Nov. 10, 1433. While his father yet lived Charles left Burgundy, and forming an alliance with some of the great French nobles for the purpose of preserving the power of the feudal nobility, he marched on Paris with 20,000 men, defeated Louis XI. at Monttheri, and won the counties of Boulogne, Guines, and Ponthieu. Succeeding his father in 1467, he commenced his reign by severe repression of the citizens of Liege and Ghent. In 1468 he married Margaret of York, sister of Edward IV. of England. Liege having rebelled, the duke stormed and sacked the town. In 1470 the war with France was renewed, and though the duke was forced to sue for a truce he soon took up arms anew, and, crossing the Somme, stormed and fired the city of Nesle. Louis meanwhile involved him in greater embarrassments by exciting against him Austria and the Swiss. Charles, ever ready to take up a quarrel, threw himself on Germany with characteristic fury, and lost 10 months in a futile siege of Neuss. He was successful, however, in conquering Lorraine from Duke Rene. Charles now turned his arms against the Swiss, took the city of Granson, putting 800 men to the sword. But this cruelty was speedily avenged by the descent of a Swiss army, which at the first shock routed the duke's forces at Granson, March 3, 1476. Mad with rage and shame Charles gathered another army, invaded Switzerland, and was again defeated with great loss at Morat. The Swiss, led by the Duke of Lorraine, now undertook the reconquest of Lorraine, and obtained possession of the city of Nancy. Charles marched to recover it, but was utterly routed and himself slain, in 1477.

CHARLES CITY, a city of Iowa, the county-seat of Floyd co. It is on the Illinois Central, and the Chicago, Milwaukee, and St. Paul railroads, and on Cedar river. Its industries, which are

important, include the manufacture of store fixtures, gasoline traction and stationary engines, wood furnishings, furniture, etc. It is an important shipping point for live stock, dairy products, nursery stock, and poultry. The city has a public library, an opera house, a home for the aged, and parks, and is the seat of Charles City College. Pop. (1910) 5,892; (1920) 7,350.

CHARLESTON, a city of Illinois, the county-seat of Coles co. It is on the Cleveland, Cincinnati, Chicago, and St. Louis, and the Toledo, St. Louis, and Western railroads. The city is the center of an important oil, gas, and coal region, and there are manufactures of flour, brooms, stoves, and tiles. It is the seat of the Eastern Illinois Normal School, and has a court house, parks, and a Carnegie library. Pop. (1910) 5,884; (1920) 6,615.

CHARLESTON, a city, port of entry, and county-seat of Charleston co., S. C.; the first city in population and importance in the State, situated at the confluence of the Ashley and Cooper rivers, 7 miles from the ocean. Charleston has one of the safest and most commodious harbors in the United States, with a depth at the inner harbor of over 40 feet and 22 feet at low water on the bar. It is defended by Forts Sumter and Moultrie and Batteries Sergt. Jasper and Capron. Two bridges connect the city with the W. shore of the Ashley river. Area, 5½ square miles; pop. (1910) 58,833; (1920) 67,957.

Topography.—The city is built on a peninsula at an average elevation of 8 to 10 feet above high water. The streets are generally at right angles, and four, King and Meeting streets, and Rutledge and Ashley avenues, run N. and S. the entire length of the city. The former is the principal retail street. At its S. extremity is a beautiful park, named White Point Garden, and to the E. of this is the Battery, a broad esplanade, 1,500 feet long, and affording a grand view of the harbor and forts. The public buildings are grouped about the intersection of Meeting and Broad streets, and consist of the court house, a substantial brick building; the City Hall, an imposing structure, entered by a double flight of steps, and the new Postoffice, a magnificent four-story building of Carolina granite, with a tower and all modern appliances, costing about \$500,000. The United States Custom house, near Market wharf on the Cooper river, is a magnificent building, having cost \$3,000,000. In front of the City Hall is Washington Park, containing two handsome foun-

tains and a statue of William Pitt, erected before the Revolution. One of the arms was shot off by the English in 1780. There is also a monument to the Confederate dead.

Manufactures.—The principal industries are fertilizers, textiles, foundries, machinery, carriages, furniture, flour, lumber, and clothing. In 1914 there were 190 plants with a capital of \$29,268,513; products, \$36,663,945, with 14,437 wage earners receiving as salaries and wages \$10,383,087.

Commerce.—The commerce of Charleston is extensive. The chief exports are cotton, cotton goods, cigars, tobacco, fruits, vegetables, lumber, and fertilizers. The total commerce for 1916 was \$320,048,883.

Banks.—In 1918 there were 19 National, savings, and State banks, with aggregate capital and surplus of \$5,077,899; deposits of \$31,002,632; and resources of \$40,367,069. The annual bank clearings exceed \$175,000,000.

Education.—There are 20 buildings devoted to school purposes, with 241 teachers, and 7,818 pupils. The annual expenditures are \$291,324. For higher education there are the College of Charleston, the Military College of South Carolina, the Medical College of South Carolina, and a number of high, normal, and technical schools.

Churches and Charitable Institutions.—Charleston has over 80 churches. The most prominent are St. Michael's, built in 1752-1761, with a tower which can be seen several miles out at sea; St. Philip's (P. E.), the first church built in the city, in the graveyard of which lie the remains of John C. Calhoun; the Circular Church (Congregational), and St. Finbar's Cathedral, rebuilt in 1890. Other noteworthy churches are Grace (P. E.), Westminster (Presbyterian), Citadel Square (Baptist), the Old Huguenot, Unitarian, Bethel and Trinity Methodist, and the Hebrew Synagogue. The most prominent charitable institutions are the Orphan House, founded in 1792, the oldest of its kind in the United States; the Enston Home for the Aged; Home for Widows and Daughters of the Confederate Soldiers; the City and the Roper Hospitals; the Alms House, and the Old Folks' Home for Aged Colored People. Among charitable societies are St. Andrew's Society, founded by Scotchmen in 1720, the oldest society in the city, and the South Carolina Society, founded by the Huguenots in 1736, formerly the Two-Bit Club, so called from the sum contributed by each member at each meeting, for the relief of the indigent among themselves.

Finances.—In 1919 the funded debt was \$4,118,000. The total assessed realty valuation was \$16,551,978. The budget was \$921,758. The tax rate was 3.35.

History.—Charleston was founded in 1670, receiving from France about 1685 a large influx of Protestant refugees. It was taken by the British in 1780, but evacuated in 1782. It was here that the first open movement was made in favor of secession. In 1860 and 1861 the harbor was the scene of several conflicts, and Fort Sumter was reduced to ruins. The harbor was blockaded in 1861, and several dismantled hulks were filled with stones and sunk in order to prevent passage. In August, 1863, the city was bombarded, and in February, 1865, after 565 days of continuous military operations, during which period 2,550 shells reached the city, it was occupied by Federal troops. On Aug. 31 and Sept. 1, 1886, the city was partially destroyed by an earthquake. Earth tremblings continued for some months thereafter, but with indomitable energy the city was soon restored to its former beauty and prosperity. On Dec. 1, 1901, a South Carolina Inter-State and West Indian Exposition was opened here.

CHARLESTON, a city, capital of the State of West Virginia, and county-seat of Kanawha county, at the junction of the Kanawha and Elk rivers, on the Chesapeake and Ohio, and other railroads, 130 miles S. by W. of Wheeling. It is an important commercial and coal mining center, with steamer communications with all Ohio and Mississippi river ports; has extensive salt springs, State house, Custom house, hospital and opera house, several National banks, and daily and weekly newspapers, etc. Pop. (1910) 22,996; (1920) 39,608.

CHARLESTOWN (Mass.). See BOSTON.

CHARLES TOWN, a village and county-seat of Jefferson co., W. Va.; on the Baltimore and Ohio, and the Norfolk and Western railroads, 10 miles S. W. of Harper's Ferry. It is the center of an agricultural region, is noted as being the place of the capture, trial, and execution (Dec. 2, 1859), of John Brown, and has a National bank, several weekly newspapers, etc.

CHAR-LOCK, a small cruciferous plant with yellow flowers, commonly called wild mustard. It is very common and troublesome in cornfields.

CHARLOTTE, a city of Michigan, the county-seat of Eaton co. It is on the Grand Trunk and the Michigan Central

railroads. The city has important industries, including the manufacture of furniture, automobiles, bridges, road culverts, etc. It has a public library. Pop. (1910) 4,886; (1920) 5,126.

CHARLOTTE, a city and county-seat of Mecklenburg co., N. C., on Sugar creek, and the Southern, the Seaboard Air Line, and several other railroads, 226 miles N. E. of Atlanta, Ga. It is the trade center of Mecklenburg and surrounding counties, and also the center of the Southern cotton mill industry, having more than 300 mills within a radius of 100 miles; is the seat of Biddle University, and a military institute; has several churches, parks, opera houses, public library, National banks, and weekly newspapers. The Mecklenburg Declaration of Independence was adopted here in 1775, and the city was occupied by the British in 1780. Pop. (1910) 34,014; (1920) 46,338.

CHARLOTTE AMALIE, the capital of the island of St. Thomas, Virgin Islands of the United States, West Indies. It has a spacious harbor. Pop. about 8,000.

CHARLOTTE AUGUSTA, PRINCESS, daughter of Queen Caroline and George IV., born at Carlton House, Jan. 7, 1796. She was carefully educated and highly accomplished. In 1816 she married Prince Leopold of Coburg, afterward King of the Belgians, and died Nov. 5, 1817.

CHARLOTTENBURG, a town of Prussia, on the Spree, about 3 miles from Berlin, of which it is one of the most important residential suburbs, with a palace and park, important educational institutions, and many places of amusement, as also a number of industrial and manufacturing establishments. Pop. about 350,000.

CHARLOTTESVILLE, a city and county-seat of Albemarle co., Va., on the Chesapeake and Ohio and the Southern railroads, and on the Rivanna river, 96 miles S. W. of Washington. It is the seat of the University of Virginia and within 3 miles of Monticello, the home of Thomas Jefferson; is a popular summer resort; has important manufactures, electric lights and street railways, a National bank, several daily and weekly newspapers, etc. Pop. (1910) 6,765; (1920) 10,688.

CHARLOTTETOWN, a city and capital of Prince Edward Island, Canada, in Queen's co., on Hillsborough bay, at the confluence of three rivers, and on the Prince Edward Island railway. The city

is well laid out, and has an excellent harbor, fine Provincial and Dominion buildings, Postoffice, Y. M. C. A. building, court house, Roman Catholic cathedral, public library, and an Insane Asylum. It is the seat of Prince of Wales College, St. Dunstan's College, and a Methodist college; has a high school, a business college, and several common schools, and many industries, including foundries, machine shops, carriage and furniture factories, breweries, etc. Charlottetown is connected with various parts of the Dominion by steamship lines. It is lighted by gas and electricity; has an extensive water works system, several daily and weekly newspapers, and banks, and is the see of a Roman Catholic bishop. Pop. about 12,000.

CHARON (kā'ron), the ferryman who conducted the souls of the departed in a boat across the Stygian lake to receive judgment from Heacus, Radamanthus, and Minos, the judges of the infernal regions. He received an obolus from every passenger, for which reason that piece of money was placed in the mouths of the dead. He was said to be the son of Erebus and Night.

CHARPENTIER, GUSTAVE, a French composer, born in Dieuze, France, in 1860. He studied music at the Paris Conservatory and in 1892 produced a symphonic drama entitled "Life of the Poet." His most notable work was the opera "Louise," for which he wrote both the words and music. This was produced in 1898 in Paris and later in Germany, England, and the United States. Other works of his also were received with considerable success.

CHARTA, MAGNA. See MAGNA CHARTA.

CHARTERHOUSE, a celebrated school and charitable foundation in London, England. In 1370 Sir Walter Manny and Northburgh, Bishop of London, built and endowed it as a priory for Carthusian monks (hence the name, a corruption of Chartreuse, the celebrated Carthusian convent). After the dissolution of the monasteries it passed through several hands till it came into the possession of Thomas Sutton, who converted it into a hospital, richly endowed, consisting of a master, preacher, head schoolmaster, with 44 boys and 80 indigent gentlemen, together with a physician and other officers and servants of the house. Each boy is educated at a certain expense, and each pensioner receives food, clothing, lodging, and an allowance of about \$130 a year. The

poor brethren must be over 50 years of age, and members of the Church of England. The Charterhouse School has been removed to new buildings near Godalming in Surrey, while the non-academic department of the Charterhouse still remains in the old buildings. The school has a high reputation, and many lads are educated there other than the scholars properly so called. Several of the famous men who have received their education at the Charter-house are Isaac Barrow, Addison, Steele, John Wesley, Blackstone, Grote, Thirlwall, Havelock, John Leech and Thackeray.

CHARTER OAK, a tree which formerly stood in Hartford, Conn., in the hollow trunk of which the colonial charter is said to have been hidden. The story is that when Governor Andros went to Hartford in 1687 to demand the surrender of the charter, the debate in the Assembly over his demand was prolonged until darkness set in, when the lights were suddenly extinguished, and a patriot, Captain Wadsworth, escaped with the document and hid it in the oak. The venerable tree was preserved with great care until 1856, when it was blown down in a storm.

CHARTERS TOWERS, a mining township of Queensland, Australia, on the N. spurs of the Towers Mountain, 820 miles N. W. of Brisbane. It dates from the gold discovery here of 1871-1872, and was incorporated in 1877. It has railway connection with Townsville on the coast and is in the center of rich gold fields. Pop. about 18,000.

CHARTIST, a name given to a political party in England whose views were embodied in a document called the "People's Charter." The chief points were universal suffrage, vote by ballot, annual parliaments, payment of members, equal electoral divisions, and the abolition of property qualification for members. These principles were set out in a bill prepared in 1838. The party became divided in the following year, the extreme members advocating the employment of force for the attainment of their object. These were known as Physical Force Chartists. The rise of the Chartists was in large measure produced by distress, and with rising wages and cheapening food, the movement died away. Some of the most important points of the Charter, and notably household suffrage and vote by ballot, have been accepted by the Legislature and are the law of the land.

CHARTRES (shär'tr), a town and capital of the department of Eure-et-Loire, France, on the Eure, 48 miles S. W. of

Paris. The cathedral is reckoned one of the finest Gothic buildings in France. The town has one of the most important corn markets in the country, and manufactures hosiery, hats, and leather. This is a very ancient city, being accounted, before the Roman conquest, as the capital of Celtic Gaul. Henry IV. was crowned here in 1594. Pop. about 25,000.

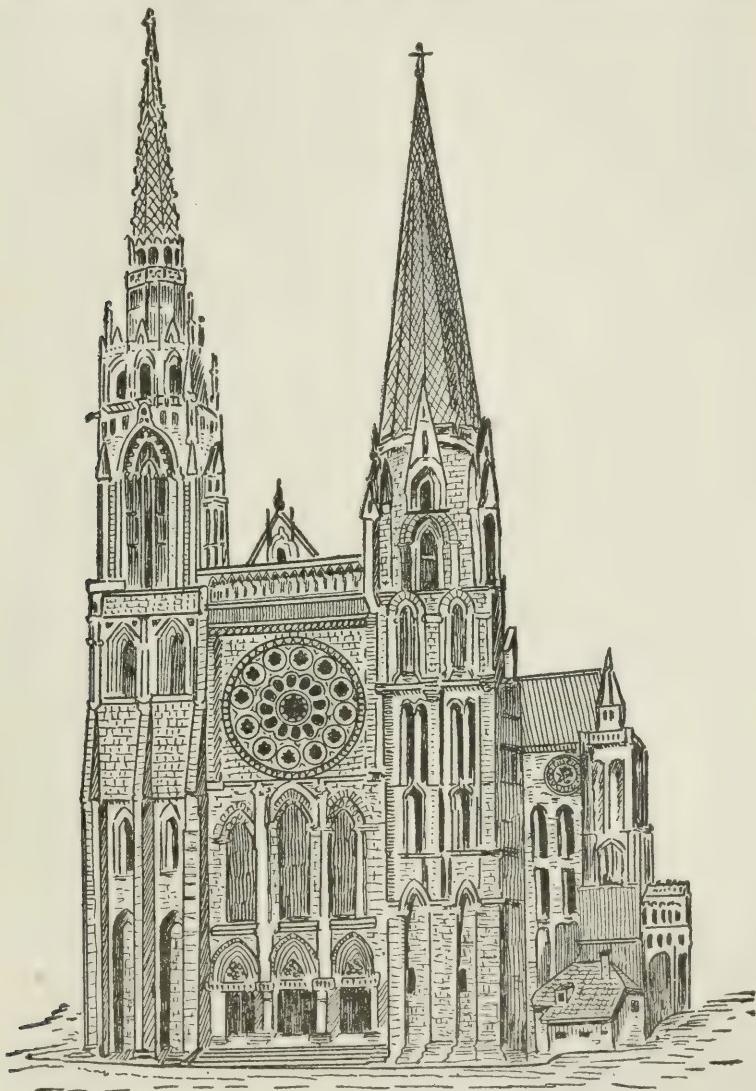
CHARTRES, ROBERT PHILIPPE LOUIS EUGÈNE FERDINAND D'ORLÉANS (DUC DE) grandson of Louis Philippe, King of the French, was born in Paris, Nov. 9, 1840. When only two years old he lost his father, and six years later the Revolution drove him, along with his family, into exile. The young duke was brought up in England, and joined the Union army in the first campaign of the American Civil War, in 1862. He married, June 11, 1863, Françoise Marie Amélie d'Orléans, daughter of the Prince de Joinville. He died Dec. 5, 1910.

CHARTREUSE, LA GRANDE (shär-trez'), a famous monastery of France, in the department of Isère, 14 miles N. of Grenoble, among lofty mountains, at an elevation of 3,281 feet above sea-level. The access to it is very difficult. It was built in 1084, but having been several times pillaged and burnt down, the present building was erected after 1676. It is of vast extent, and cost an immense sum. During the Revolution, the monks were driven out, and their property, including a valuable library, confiscated and sold; but in 1826, the building, which had escaped the revolutionary tempest, was restored to its original destination, and was the chief monastery of the Carthusians until 1903, when the monks, as the result of the new Law of Associations of 1901, were expelled from France. The inmates, about 30 in number, derived their principal subsistence from the sale of the celebrated liqueur, which they manufactured under the name of Chartreuse, and in the composition of which enter many aromatic herbs.

CHASE, SALMON PORTLAND, an American jurist, born in Cornish, N. H., Jan. 13, 1808; educated at Windsor, Vt., in his uncle's family at Columbus, O., and in Dartmouth College; taught school in Washington, while studying law with William Wirt; opened law practice in Cincinnati, where he edited the "Ohio Statutes," and came to public notice. In 1846 he argued the Fugitive Slave Law with William H. Seward, in a celebrated case, and his support of the anti-slavery cause soon made him the leader of the

Liberty party, and a leading spirit in the Free-Soil and Republican parties. In 1849 he was elected to the United States Senate; in 1855 Governor of Ohio; in 1860 was a prominent candidate for the Republican Presidential nomination; ap-

CHASE, WILLIAM MERRITT, an American artist, born in Franklin, Ind., Nov. 1, 1849. He studied painting in oil at the National Academy in New York and subsequently in Europe with Piloty. He made a specialty of portraits, figure



CATHEDRAL AT CHARTRES

pointed Secretary of the Treasury by President Lincoln, in 1861, and in 1864 became Chief Justice, in which office he presided at the impeachment trial of President Johnson. He died in New York City, May 7, 1873.

pieces, and still life. Examples of his art are to be found in many public and private galleries in this country. He was elected a National Academician in 1890. Besides having been one of the most brilliant technicians of the Ameri-

can school, he was particularly successful as a teacher. He died in 1916.

CHASSEUR (*shäs-er'*) a male attendant upon persons of distinction, attired in a military dress, and wearing a sword. It is also the name given by the French to bodies of light infantry which act as skirmishers and sharpshooters. The name was originally given to some troops raised in 1815, in imitation of the Jägers of the Austrian army, who were chiefly Tyrolese chamois-hunters, and unerring marksmen. The French Chasseurs are of two kinds, light cavalry and infantry. The Chasseurs of the Italian army are called Bersaglieri.

CHASTELARD, or CHASTELET, PIERRE DE BOSCOSEL (*shät-lär'*), a French poet, nephew of the Chevalier Bayard, born about 1540. He was one of the French gentlemen who accompanied Mary Stuart on her return to her native country. The young and handsome poet fell in love with the beautiful queen, and in his madness, believing that his addresses were encouraged, he invaded the bedroom of Mary, was discovered, and ordered to quit the court. Chastelard, however, again concealed himself, Feb. 14, 1563, within a recess in the bedroom of Mary, at Burntisland. For this offense, he was brought publicly to trial at St. Andrew's, sentenced to death, and hanged; the queen remaining inaccessible to all appeals for mercy on his behalf.

CHÂTEAU, CHATEL, or CASTEL (*shä-tō'*), from the Lat. *castellum*, "a fort," enters as a component part into many names of places in France. A "château en Espagne" is a castle in the air. The word is also applied to the residences of feudal lords and, in France, to country estates in general.

CHÂTEAUBRIAND, FRANÇOIS RENÉ AUGUSTE, VICOMTE DE (*shä-to-brē-on'*), a French statesman, traveler, novelist, and historical writer, born in St. Malo, Sept. 14, 1768. He made a voyage in search of the Northwest Passage in 1791; but on touching the American continent abandoned that quest, and proposed to himself a study of the life of the American Indians. He lived for some time among the aborigines, and the fruits of his observations were the three novels "*Atala*," "*René*," and "*The Natchez*," which by the charms of the literary style and the interesting poetical descriptions of life remote from civilization, won instant and great popularity. Perhaps his greatest and certainly his most ambitious work is "*The Genius of Christianity*" (5 vols., 1856-1857). Of works connected with literature and its

history he wrote "*An Essay on English Literature*" and translated Milton's "*Paradise Lost*." He died in Paris, July 4, 1848.

CHÂTEAU-THIERRY, a French town on the right bank of the Marne in the department of the Aisne, 59 miles N. E. of Paris. It is notable as being the birthplace of La Fontaine and the scene of a battle in which Napoleon defeated the Prussians and Russians, Feb. 12, 1814. During the Franco-Prussian War in 1870, the German Emperor made the town for a time his headquarters. It is a center of the wine trade and its chief manufactures are woolen yarn, musical and scientific instruments. Stone is extensively quarried. Its population preceding the World War was 7,771.

The name of Château-Thierry will ever be associated in American minds with the memorable deeds done there by United States troops in the World War. On May 31, 1918, American machine gun units were hurried in motor lorries to the town, the outskirts of which had already been reached by the advancing Germans. The little city lay on both sides of the Marne, which was spanned by a long bridge. To the north, there was a canal, running parallel with the river and crossed by a smaller bridge. On June 1 the Germans drove a gap through the Allied lines to the left of the town and poured through the streets toward the main bridge, intending to cross the river and establish themselves on the opposite bank. The French colonials and the Americans were sent forward to repel the attack. The Americans defended the bridge, and working with coolness and precision, though most of them were under fire for the first time, they raked the enemy line so effectively that the Germans wavered and retreated. The next night under cover of darkness they made another attempt, but were again met with a devastating fire from the American machine guns. Some of them persisted, however, and were on the bridge when it was blown up, throwing many into the river, while those who remained on the south side of the shattered structure were immediately taken prisoner. All subsequent attempts to cross the river were nullified by a storm of machine gun fire, and the enemy finally abandoned the attempt after suffering heavy casualties.

Again in the Château-Thierry region, at Jaulgonne and Dormans, the Americans were the principal factor in checking the thrust of the German Crown Prince at Paris. It was the last great effort of the German offensive. On July 15 the enemy launched a terrific at-

tack against the American position at Jaulgonne and Dormans. Twenty-five thousand of the choicest of the German troops were hurled across the Marne. The American front was held by the 1st, 2d, 3d and 26th Divisions, with the 4th and 28th Divisions in support. Under the first fury of the assault, the American line was pushed back, but it promptly rallied and threw the Germans back across the Marne with tremendous losses.

front of the 3d Division sector except the dead."

"On this occasion," writes General Pershing in his official report, "a single regiment of the 3d Division wrote one of the most brilliant pages in our military annals. It prevented the crossing at certain points on its front, while on either flank the Germans, who had gained a footing pressed forward. Our men, firing in three directions, met the Ger-



HOTEL DE VILLE, CHÂTEAU-THIERRY

A paragraph from the report of the commanding General of the 3d Division thus summarized the result of the fighting on his front:

"Although the rush of the German troops overwhelmed some of the front line positions, causing the infantry and machine gun companies to suffer in some cases a 50 per cent. loss, no German soldier crossed the line from Fossey to Crezancy except as a prisoner of war, and by noon of the following day (July 16) there were no Germans in the fore-

man attacks with counter-attacks at critical points, and succeeded in throwing two German divisions into complete confusion, capturing 600 prisoners."

CHÂTELAIN, the wife of the châtelain or Castellan, the commander of a feudal castle.

CHATHAM (chat'am), a parliamentary borough, naval arsenal, and port of England, county Kent, on the Medway, about $34\frac{1}{2}$ miles by rail from London. The importance of Chatham is due to the

naval and military establishments at Brompton in its immediate vicinity. The royal dockyard was founded by Queen Elizabeth previous to the sailing of the Armada. It has been greatly enlarged in recent times, and has now capacious docks, in which the heaviest warships can be equipped and sent directly to sea. Building-slips, sawmills, metal-mills, etc., and all the requisites of a great naval station are here on the largest scale and in the finest order. The military establishments include extensive barracks, arsenal, and park of artillery, hospital, store-houses and magazines, etc. The town is poorly built, but is defended by a strong line of fortifications which also serve as a flank defense. Pop. about 45,000.

CHATHAM, a town of Ontario, Canada, on the Thames; 67 miles S. W. of London, with a number of flour, wool, and steel mills and foundries, sugar, automobile, carriage, metal, cement, packing, tobacco, fertilizer plants, etc., and an active trade in grain, pork, and wood. Pop. about 15,000. Also a port of entry in the N. of New Brunswick, on the Miramichi, 6 miles N. E. of Newcastle, with a good harbor, shipyards, foundries, and other industries, a Catholic cathedral, and a college. Pop. about 5,000.

CHATHAM, WILLIAM Pitt, EARL OF, an English statesman, the son of Robert Pitt of Boconnoc, in Cornwall; born Nov. 15, 1708, and educated at Eton and Oxford. He entered Parliament and soon attracted notice as a powerful opponent of Walpole. In spite of the King's dislike Pitt was powerful enough to win a place in the administration (1746). In 1756 he became Secretary of State and real head of the government. Dismissed in 1757 on account of his opposition to the King's Hanoverian policy, no stable administration could be formed without him, and he returned to power the same year in conjunction with the Duke of Newcastle. It was under this administration and entirely under the inspiration of Pitt that Great Britain rose to a place among the nations she had not before occupied. Wolfe and Clive, both stimulated and supported in their great designs by Pitt, won Canada and India from the French, and the support the Great Commoner gave Frederick of Prussia contributed not a little to the destruction of French predominance in Europe. The accession of George III. brought Lord Bute into power, and Pitt, disagreeing with Bute, resigned in 1761. In 1766 he strongly advocated conciliatory measures toward

the American colonies, and undertook the same year to form an administration, he going to the House of Lords as Earl of Chatham. But the ministry was not a success, and in 1768 he resigned. After this his principal work was his unsuccessful appeals for a conciliatory policy toward the colonies. Chatham died May 11, 1778.

CHATHAM ISLAND, one of the Galapagos archipelago, in the Pacific Ocean; 600 miles W. of Ecuador, to which it belongs. It is of volcanic origin, the fifth in size of the Galapagos, and abounds in turtles and a small species of cat. Chatham Island has been the subject of negotiation between the United States and Ecuador, the former desiring it as a coaling station. It would possess strategic importance in the event of the opening of an isthmian canal. See GALAPAGOS.

CHATHAM ISLANDS, a small group in the Pacific, lying 360 miles E. of New Zealand, to which they politically belong. There are three islands—of which the largest, Chatham Island, is 25 miles long—and some rocky islets. Total area, 375 square miles; pop. (1916) 477, of whom 258 are Maoris and Morioris or aborigines. The Chatham Islands were discovered in 1791 by Lieutenant Broughton, of the brig "Chatham." A large brackish lake occupies the interior of Chatham Island, which is of volcanic origin and hilly. Stock-rearing and seal-fishing are the chief industries, and a lively trade is carried on with passing whalers. Timber of any size is unknown, so that the native canoe is merely wicker-work bound together by cordage of indigenous flax.

CHÂTILLON-SUR-SEINE, (sha-té-yōn'-sür-sen), a town in France, department of Côte d'Or, 45 miles N. W. of Dijon, on the Seine. It is chiefly noted for the Congress of the Allied Powers and France, held here in 1814.

CHATTANOOGA, city and county-seat of Hamilton co., Tenn.; on the Tennessee river, with railroad and steamship communications with all southern ports. It is situated on high grounds, at the foot of Lookout Mountain, and in the midst of picturesque scenery. It is the site of a National Soldiers' Cemetery, with over 13,000 graves, and the Chattanooga and Chickamauga National Military Park.

The manufacturing interests of the city are favored by the nearby deposits of coal, iron, clay, and other minerals, and also by the hydro-electric power derived from the Tennessee and Ocoee rivers, to utilize which plants costing \$15,-

000,000 have been built. The Federal census of 1914 showed a capital investment of \$20,615,000; value of products, \$19,652,000; 7,085 wage earners, and salaries and wages of \$5,461,000. There are over 300 factories producing over 1,200 different articles. The principal manufactures are foundry and machine shop products, lumber, furniture, steel, railroad cars, shovels, and breakfast foods.

Public Buildings.—The city abounds in beautiful buildings, among which are the Court house, of Tennessee marble, costing \$500,000; the Hotel Patten, a million-dollar structure; the Y. W. C. A., Carnegie library, terminal station, besides many handsome churches.

Charitable institutions include the Old Ladies' Home, Pine Breeze Tuberculosis Sanitarium, Baroness Erlanger Hospital, Vine Street Orphans' Home, Frances Willard Working Girls' Home, and Kosmos Cottage.

There are excellent schools, with an average attendance of about 10,000. The city's churches number over 120. There are two private secondary schools, besides the City High School and the Central High School. For higher education there are the University of Chattanooga and the Chattanooga School of Law.

Banking.—Chattanooga has 11 banks, with a capital and surplus of over \$6,000,000. The bank clearings in 1919 were \$189,002,000.

History.—Chattanooga was settled in 1836, and was originally called Ross's landing. It was incorporated in 1851, and in 1863 was occupied and nearly destroyed by the Union forces. It was the scene of three of the greatest battles of the Civil War: Chickamauga, Missionary Ridge, and Lookout Mountain. Pop. (1910) 44,604; (1920) 57,895.

CHATTEL, in the law of England, is a term used to designate any kind of property which, with reference either to the nature of the subject or the character of the interest possessed in it, is not freehold. Ownership in personal or movable property is generally absolute. Any estate or interest in lands and tenements not amounting to freehold is chattel. But as between property thus "savoring of realty" and mere personal movables—money, plate, cattle, and the like—there was a manifest distinction. Chattels were consequently distinguished into chattels-real and chattels-personal. These classes of property differ considerably as to the method of holding and transferring them and their devolution on death.

CHATTERTON, THOMAS, an English youth whose genius and melancholy fate have gained him much celebrity; born at Bristol in 1752, of poor parents, and educated at a charity school. He exhibited great precocity, became extremely devoted to reading, and was especially fond of old writings and documents. At the age of 14 he was apprenticed to an attorney. In 1768, when the new bridge at Bristol was completed, he inserted a paper in the "Bristol Journal" entitled "A Description of the Friars' First Passing Over the Old Bridge," which he pretended he had found along with other old manuscripts in an old chest in St. Mary Redcliffe Church, Bristol. He also showed his friends several poems of similar spurious antiquity which he attributed to one Rowley. In 1769 he ventured to write to Horace Walpole, then engaged upon his "Anecdotes of Painters," giving him an account of a number of old Bristol painters which was clever enough to deceive Walpole for a time. Dismissed from the attorney's office, he left with his manuscripts for London, where a favorable reception from the booksellers gave him high hopes. For them he wrote numerous pamphlets, satires, letters, etc., but got no substantial return, and his situation became daily more desperate. At last, after having been several days without food, he poisoned himself, Aug. 25, 1770. The most remarkable of his poems are those published under the name of Rowley, spurious antiques, such as "The Tragedy of *Aella*," "The Battle of Hastings," "The Bristow Tragedy," etc.

CHAUCER, GEOFFREY, "the father of English poetry"; born in London probably about 1340. He was the son of a vintner named John Chaucer. Nothing is known of his education, but in 1356-1359 he was a page to Princess Lionel. In 1359 he bore arms in France and was taken prisoner. He was ransomed next year, the king paying \$80 toward the necessary sum. In 1367 his name appeared as a valet of the king's chamber. In 1367 he received a pension of 20 marks, and between 1370 and 1380 he was employed abroad in seven diplomatic missions. In 1374 he was appointed comptroller of the customs on wool at London, a lucrative post, and he also received an annual allowance. In 1377 he was sent to Flanders and France on diplomatic business and next year to Lombardy. In 1382 he was appointed comptroller of the petty customs. In 1386 he was returned to Parliament as knight of the shire for Kent, but in the same year he shared the disgrace of his patron, John of Gaunt, was

dismissed from his comptrollership, and reduced to a state of comparative poverty. Three years later, however, he was made clerk of the works at two shillings a day, and afterward had other offices and one or two annuities bestowed upon him, but in 1394-1398 must have been quite poor. In 1399 he got a pension of 40 marks from Henry IV., but did not live long to enjoy it. His most celebrated work, "The Canterbury



GEOFFREY CHAUCER

"Tales," was written at different periods between 1373 and 1400. It consists of a series of tales in verse (two in prose), supposed to be told by a company of pilgrims to the shrine of St. Thomas (Becket) at Canterbury in 1386. In its pages we get such pictures of English life and English ways of thought in the 14th century as are found nowhere else. Besides his great work Chaucer wrote many poems: "The Book of the Duchess" (1369), "The Parliament of Fowls" (1374), "Troilus and Cressida" (1380-1382), "The Legend of Good Women" (1385), "The House of Fame" (1386), etc., some of which are founded on French or Italian works. He also translated "Boethius." He died in London, Oct. 25, 1400, and was buried in Westminster Abbey.

CHAUDIÈRE (shôd-yâr'), a river and lake of Canada. The river joins the St. Lawrence from the S., 7 miles above Quebec, and, 2½ miles from its mouth, forms the celebrated falls of Chaudière. The lake—merely one of the many expansions of the Ottawa—has on its right the city of that name, the capital of the Dominion.

CHAUMONT (shô-mon), a town of France, capital of the department of Haute-Marne, on a height between the Marne and the Suize, with manufactures in woolens, hosiery, etc. Here the allies (Great Britain, Russia, Austria, and Prussia) signed the treaty of alliance against Napoleon, March 1, 1814. Pop. about 15,000.

CHAUTAUQUA INSTITUTION, an organization founded in 1874 to carry on educational activities through various methods; first, by public assembly held annually; second, through summer schools, also held annually; and, third, through home reading courses. The assemblies are held each year at Chautauqua, N. Y., and many notable lecturers are on the educational staff. Over 50,000 persons regularly attend the annual assemblies. In the home reading courses are enrolled over 10,000 members. In 1919 a campaign was carried on for funds for the support of the institution. Nearly \$600,000 had been raised by the end of the year. On the faculty of its summer schools are over 90 teachers.

CHAUTAUQUA LAKE, a beautiful lake in Chautauqua co., New York, 18 miles long and about 2 miles wide, 726 feet above Lake Erie, from which it is 8 miles distant. On its banks is the village of Chautauqua, the center of the religious and educational movement known as **CHAUTAUQUA INSTITUTION** (*q. v.*).

CHAUVENET, WILLIAM, an American astronomer and mathematician; born in Milford, Pa., May 24, 1819. He was graduated at Yale in 1839, and became instructor in mathematics at the Philadelphia Naval Asylum in 1841, professor of mathematics and astronomy at the United States Naval Academy in 1845, and professor of astronomy at Washington University, St. Louis, in 1859. In 1862 he became chancellor of the last institution. He wrote "Spherical and Practical Astronomy," "Elementary Geometry," and similar works. He died in St. Paul, Minn., Dec. 13, 1870.

CHAUX-DE-FONDS, LA, a town of Switzerland, in the canton of Neuchâtel. It is in the valley of the Jura, about 3,000 feet above sea-level. The town contains a Protestant church, a hospital, a college, and other institutions. Its chief industry is the manufacture of watches, scientific instruments, and articles in gold, silver, bronze, and enamel. Pop. about 40,000.

CHAVANNES. See PUVIS DE CHAVANNES.

CHECKERS or **CHEQUERS**, (also called **DRAUGHTS**), a game played by two persons on a board similar to that used in playing chess. Each player has a set of 12 pieces, consisting of small, round, flat disks, made of wood or ivory; one set being black and the other white. The pieces must all be placed on the same color on the board, in alternate fours in the first three rows before each player. The pieces must move only one square at a time, diagonally and forward. If an opponent's piece stands in the way, there is no retreat—the player must either advance or take his adversary's piece. A piece can only be taken, however, when there is a vacant space directly behind it; the attacking piece is lifted over and placed on this vacant square, while the piece leaped over is removed from the board. The object is either to take all the adversary's pieces, or to hem them in so that he cannot play. The game increases in interest toward the close, as those pieces that reach a vacant square on the adversary's king row become kings (or, as some style them, queens), that is, their power is doubled, and they can move backward or forward to all parts of the board. The game of checkers does not require so much science as chess, but it is a favorite recreation with a great number of people. In France it is called *Les Dames*, probably on account of its always having been very popular with ladies.

CCHEDUBA, or **MANAUNG**, an island in the Bay of Bengal, belonging to Burma, about 25 miles off the coast of Ar-racan; length and breadth, each about 15 miles; area, about 300 square miles; pop., 8,534. The soil is fertile and produces tobacco, rice, indigo, pepper, etc. Petroleum is also found. Pop., about 35,000.

CHEESE, the curd or caseine of milk, with variable quantities of butter and common salt, pressed into molds and ripened by keeping. The various kinds of cheese differ chiefly in the mode of manufacture, the amount of fat which they contain, and in the flavor, which is due partly to the food, and partly to the breed of the animal. In this country, and in England, cheese is made from the milk of the cow, but on the continent of Europe it is made from goat's milk and ewe's milk, while in Arabia it is prepared from the milk of the camel and the mare. There are three kinds of cheese, viz., whole-milk, skim-milk, and cream-cheese. Whole-milk cheese is made from unskimmed milk and contains from 20 to 40 per cent. of fat or cream, and 30 to 50 per

cent. of caseine. Skim-milk cheese is poor in fat, containing from 1 to 4 per cent. Cream-cheese contains from 60 to 70 per cent. Authorities differ as to the dietetic value of cheese, some affirming that it is very indigestible, while others assert that it assists digestion. Its digestibility, however, varies with its age, its texture, and its composition, and it is possible that it may produce different effects on different persons. Cream-cheese is more digestible than any other kind of cheese, owing to its containing less caseine. Cheese is rarely adulterated. To suit the public taste it is frequently colored with annatto, or some other vegetable color, and so long as the coloring matter is not injurious, it cannot be considered an adulteration.

There were in the United States in 1919 about 2,100 cheese factories. The production was 26,256,549 pounds of cheese, made from whole milk; 276,674 pounds made from part skinned milk; and 528,067 pounds made from full skinned milk. The production of special cheese included 2,629,450 pounds of Swiss cheese; 2,462,945 pounds of Buck and Münster cheese; 748,086 pounds of Limburger cheese; 1,895,083 pounds of cottage, pot, and baker's cheese; 376,972 pounds of cream and Neuchâtel cheese; and 279,230 pounds of Italian cheese.

CHEETAH, or **CHITA**, an East Indian name for *felis jubata*, the hunting leopard.

CHEFOO, or **CHI-FU** (properly the name of the European colony of the Chinese town of Yen-Tai), a treaty port on the N. side of the peninsula of Shantung, at the entrance to the Gulf of Pechili, in which it is the only port that remains open throughout the winter. The foreign quarter is in some sense a colony of Shanghai, and, having the best climate of all the treaty ports, it is much resorted to by convalescents. The port has developed into an important coaling station. As a market for foreign manufactured goods, particularly English cotton yarn and American sheetings, Chefoo is of considerable importance. The principal articles of import besides those mentioned are sugar, paper, iron, edible seaweed, and matches. The chief exports are silk, straw-braid, bean-cake, and vermicelli. The Chefoo Convention, which settled several disputed points between China and Great Britain, and extended certain commercial advantages to the latter country, besides throwing open four new treaty ports, was signed there Sept. 13, 1876. The port was the scene of a naval demonstration in 1900, when British and American warships

threatened to bombard the forts if their hostile attitude was not abandoned. There were 150 missionaries in the city, whose rescue from peril was thus effected. Pop. about 55,000.

CHEH-CHIANG, or **CHEH-KIANG**, a maritime province of China proper, in which is included the Chusan archipelago. Cheh-Chiang is bounded N. by the province of Chiang-Su (Kiang-Su), E. by the Eastern sea or East China Sea (Tung-Hai), S. by the province of Fu-Chien (Fo-Kien), and W. by the provinces of Chiang-Hsi (Kiang-Si) and Ngan-Hwei (An-Hui or Gan-Hui). As a province, Cheh-Chiang is of great commercial importance, containing three treaty ports, Ning-Po, Wan-Chau (Wen-Chow), and Hang-Chau (Hang-Chow), all of which are to be connected with Shanghai by a projected railway under British control. The area of Cheh-Chiang is 36,670 square miles (about that of Indiana), and the population about 14,000,000. There are thousands of native Christians.

The province is mountainous and traversed by rivers, notably the Tsien-Tang and Ta-Kia, which run down to the Eastern sea. The Grand canal affords the only means of internal communication apart from an extensive system of narrow foot roads. Trade in silk and tea is well developed, this province being, with Chiang-Su and Fu-Kien, the first to contain a treaty port, that of Ning-Po, opened in 1844. Besides tea and silk the province produces cotton and sedge for hats and mats. It imports cotton and woolen goods, tin and iron, kerosene oil, indigo and sugar.

Hang-Chow is the capital of the province. Marco Polo visited the province in the 14th century, when it contained beautiful temples, now in ruins. The most magnificent architectural feature of the province is the temple of the Queen of Heaven, dating from 1680. Cheh-Chiang suffered severely during the Tai-Ping rebellion in 1861. It contains the gateway to the Grand canal, or system of Chinese waterways. The Italians in 1900 laid claim to part of Cheh-Chiang as a sphere of influence, and unsuccessfully demanded the privilege of establishing a port on the coast to be called San Mun.

CHEIROMANCY. See **PALMISTRY**.

CHEKHOV, ANTON PAVLOVITCH, a Russian author, born at Taganrog, in 1860. He studied medicine at the Moscow University, but soon engaged upon a literary career. His first writings were of a humorous nature and were immediately successful. He soon wrote in

a more serious vein and was proclaimed by literary circles to be the greatest figure in Russian literature since the days of Turgenev. He wrote over 150 short stories, a number of plays, and one complete novel. Comparatively few of his writings have been translated into English. These are stories which have appeared in magazines. Among his plays, accessible in the English, are "The Sea Gull" (1905); "The Cherry Garden" (1908); "The Swan Song" (1912), and "Uncle Vanya" (1912).

CHELMSFORD, **FREDERIC AUGUSTUS THESIGER, LORD**, eldest son of the first Lord Chelmsford, who was twice lord-chancellor of England; born May 21, 1827, educated at Eton, served in the Crimea and through the Indian mutiny. As deputy adjutant-general he served in the Abyssinian campaign, was nominated C. B., made aide-de-camp to Her Majesty, and adjutant-general to the forces in India (1868-1876), and in 1877 was appointed commander of the forces and lieutenant-governor of Cape Colony. He restored Kaffraria to tranquillity, and was given the chief command in the Zulu war of 1879. After great difficulties with the transport, and some disasters, he gained the decisive victory of Ulundi, before the arrival of Sir Garnet Wolseley, who had been sent to supersede him. On his return to England he was made G. C. B., and in 1884 lieutenant of the Tower. He died in 1905.

CHELMSFORD, **FREDERIC JOHN NAPIER THESIGER, 3rd BARON**, an English administrator, born in 1868. He was educated in Oxford, and after filling several posts in the administration of London, he was appointed Governor of Queensland in 1905, serving until 1909, when he became Governor of New South Wales. He remained in this post until 1913. In 1916 he was appointed Viceroy of India.

CHELONE, a genus of turtles, including the tortoise, often written chelonia. See **TORTOISE** and **TURTLE**.

CHELSEA, a city in Suffolk county, Mass.; separated from East Boston by Chelsea creek, and from Charlestown by the Mystic river. It is a suburb of Boston, and is connected with it by ferries, electric and steam railroads; and the Mystic river is crossed here by a bridge 3,000 feet long. Chelsea has a United States Naval and Marine Hospital, Soldiers' Home, Fitz Public Library, court house, city hall, etc. Though Chelsea is in the Boston customs district and most of its business men are directly identified with the interests of

Boston, it has extensive manufactories of rubber goods, foundry and machine shop products, leather, cordage, brass goods, pottery, iron and steel, etc. It has numerous churches, high and graded public schools, weekly newspapers, and two National Banks. Chelsea was settled as Winnisimmet in 1630; was a part of Boston until it was organized as a town in 1738, and was incorporated as a city in 1857. The city suffered severe property losses from a destructive fire in 1908, but recovered quickly. Pop. (1910) 32,452; (1920) 43,184.

CHELSEA, formerly a suburb of London, England, now a parliamentary and metropolitan borough of Greater London, on the Thames, opposite Battersea, and chiefly distinguished for containing a royal military hospital, originally commenced by James I. as a theological college, but converted by Charles II. for the reception of sick, maimed, and superannuated soldiers. The building was finished in 1692 by Sir Christopher Wren. Connected with the hospital is a royal military asylum, founded in 1801, for the education and maintenance of soldiers' children. Chelsea has long been and still is the chief residential section in London of writers and artists. In the last century George Eliot, Whistler, Rossetti and Carlyle lived there, and the latter's former home in Cheyne Row is now a public memorial to him. The Chelsea embankment, between Victoria and Battersea bridges, is a famous London riverside promenade. Chelsea porcelain (1745-1784), enjoys a high reputation. Pop. (1918) 63,130.

CHELTONHAM, a borough of Pennsylvania, in Montgomery co. It is on the Philadelphia, Newtown and New York railroad. It is a suburb of Philadelphia and is almost entirely a residential city. Pop. (1910) 8,434; (1920) 11,015.

CHELTONHAM, a borough and watering place in Gloucestershire, England. It lies in a valley, on the Chelt river. The town is well laid out and has many public promenades, gardens, and squares. It contains the parish church of St. Mary's, dating from the 14th century, an art school, and several colleges and private schools. Its popularity is due chiefly to its mineral waters which are of great medical value. Pop. about 60,000.

CHEMICAL SOCIETY, AMERICAN, a society founded in 1876 for the discussion and consideration of subjects relating to chemistry. It holds annual meetings. It has a membership of about 7,000. It publishes the "Journal of the American Chemical Society," and the

"Journal of Industrial and Engineering Chemistry."

CHEMISTRY is that branch of science which deals with the composition of matter and the changes which it undergoes through the action of various agencies. In considering this definition, however, it is necessary to distinguish between *physical* changes and *chemical* changes. Thus, when water is frozen, it becomes a solid, and the change from the liquid state is a physical one. No alteration has been brought about in the essential nature of the water, as can be shown by melting the ice, when it again becomes water. When, however, a piece of paper is burned, it is changed into ash and a gaseous mixture, and the change which it undergoes is permanent, its essential nature being altered. In this case, the change is a chemical one, although like all chemical changes, it is accompanied by physical changes. It is not always easy to distinguish between physics and chemistry, as the two sciences come very near to one another, but it can be said that chemistry is concerned with those phenomena which involve a change in the molecular structure of a substance. The science is divided into two great branches—Inorganic and Organic. The former includes the study of all substances of a mixed character. The latter formerly concerned itself with substances of animal or vegetable origin, but this classification is no longer recognized, and it may now be said to cover the chemistry of the compounds of carbons, excluding such obviously inorganic substances as mineral carbonates and some similar compounds.

Particular departments of Chemistry, where the science is confined to the examination of special objects, receive distinctive names, as Physical Chemistry, or Chemical Physics, which considers phenomena bordering on Physics and Chemistry; Mineralogical Chemistry, which takes cognizance of the composition of minerals; Physiological Chemistry, which includes the changes which food undergoes in its transit through the animal economy, and the transformations that take place in substances of organized beings generally; Agricultural Chemistry, which relates to the composition of soils and manures, the ingredients in plants, and the best modes of supplying the food that they require, etc. Two classes of chemical work may be accepted as typical of the science. One is *analysis*, signifying unbinding; and the other is *synthesis*, or putting together. By the first process the chemist ascertains the composition of a substance; by the second process he forms a substance by bringing together

and combining the constituents. Analysis has been applied to almost all substances that exist on the earth, as well as to meteorites, and it has been found that they are all composed of about 80 constituents which are called *elements*. But of these only 12 enter largely into the composition of the earth.

History.—The Egyptians, of all nations of antiquity, appear to have had the greatest amount of chemical knowledge. They skillfully preserved dead bodies from decay, fixed colors in silk by means of mordants, prepared many medicines and pigments, as also soap, beer, vinegar, metals and metallic alloys, common salt, vitriol, soda, sal ammoniac, glass, enamel, tiles, and painted earthenware. The Chinese were very early acquainted with the processes for dyeing and the preparation of metallic alloys, the fabrication of niter, sulphur, gunpowder, borax, alum, porcelain, verdigris, paper, etc. From the Egyptians the Greeks and Romans derived what chemical knowledge they possessed, but they added little or nothing; and at the migration of the northern tribes, and the overthrow of the Roman Empire, a stop was put for a time to the advancement of all science in Europe. The prosecution of chemical knowledge was taken up by the Arabs before the 8th century, and was carried on by them and by their European scholars, calling themselves alchemists. The first germs of the real science of chemistry appear about the end of the 17th and beginning of the 18th century, in the speculations of Becher and Stahl. After this chemistry rapidly advanced. In 1718 Geoffrey brought out the first table of affinities; in 1732 Boerhaave published many original experiments on the chemical relations of heat and light; in 1724 Hales, and in 1756 Black, published researches on the air and aeriform bodies, showing that the carbonic acid evolved during fermentation, respiration, and by the action of acids on chalk was different from atmospheric air. In 1754-1759 Margraff added to the then known earths—lime and silica—two others, alumina and magnesia; he also extracted sugar from plants. In 1770 Priestley began to announce his discoveries of oxygen, ammoniacal, hydrochloric and sulphurous acid gases, etc. In 1772 Rutherford discovered nitrogen, and in 1773-1786 Scheele contributed chlorine, hydrofluoric, prussic, tartaric, and gallic acids; also baryta, phosphoric acid from bones, etc., and gave the first hints regarding a new doctrine of combustion. About the same time Bergman and Cavendish enlarged our knowledge of the gases. Lavoisier,

between 1770 and 1794, reorganized much of the then known chemistry, and founded a system which still remains the frame-work of the science. Berthollet, 1787, contributed much to the doctrine of affinity, and made researches in chlorine, etc. Fourcroy and Vauquelin advanced Organic Chemistry. Klaproth gave many contributions to Mineral Chemistry. Richter devoted himself to the doctrine of combining proportion in the molecule afterward perfected by Dalton. The discovery of galvanic electricity by Galvani, and its advancement by Volta, led Sir Humphrey Davy and others to important researches in the metals and gases. Gay-Lussac and Thenard advanced the knowledge of organic substances and the chemical relations of heat. Berzelius made laborious researches in mineral chemistry, and gave an exactness to this department which is an astonishment to the chemists of the present day. He was also the author of the electro-chemical theory, which was almost perfected by the labors of Faraday, De la Rive, Becquerel, etc. Organic chemistry advanced most rapidly under the researches of Liebig, Wohler, Mitscherlich, Mulder, Laurent, and, in more recent years, Bunsen, Men-deleef, Ostwald, Van't Hoff, and many others too numerous to mention.

Chemical Nomenclature.—In early times chemical substances were named according to the fanciful theories of Alchemy. Thus the name “flowers of sulphur” was applied to sulphur (sublimed), which grew or sprang like a flower from sulphur when heated; “spirit of salt,” to hydrochloric acid, the corrosive acid or spirit obtained from common salt; and a multitude of other names had a fanciful origin. In 1787 Lavoisier founded the system of nomenclature still followed by chemists. At first it was intended that the name of a simple as well as of a compound substance should be regulated by system, and that it should indicate the nature of its elementary constituents, as well as the relative proportion in which they were present. Hence such terms as oxygen, the acid-producer, given from the notion then held that no acid was without oxygen; and hydrogen, the water-producer, from the supposition that hydrogen had more to do with the formation of water than any other element. The advance of chemistry, however, so completely changed the opinion of chemists regarding the simpler bodies that such names were found to mislead; and thereafter, though such as had been given on this system were retained, their meaning was discarded, and the systematized nomenclature restricted to com-

pound substances. In the non-metallic elements a close analogy exists between chlorine, bromine, iodine, fluorine; and to indicate this the common termination *ine* has been given; and for a similar reason carbon, silicon, and boron end in *on*. As a general rule, however, the chemical name of an elementary substance does not convey any scientific meaning, and must be regarded as a simple mark or designation, analogous to the names of persons, which give no notion regarding their moral character or physical development. The ancient and more common metals retain their popular titles, such as gold, silver, and copper; but the more recently discovered metals have names given which end in *um*. The symbol of an element is obtained from the abbreviation or first letter of its Latin name, as O for "oxygen"; Pb for "lead" (Lat. *plumbum*). When the names of two or more elements commence with the same letter a smaller letter or satellite is attached to one or more of these; such as S for "sulphur," Se for "selenium," and Si for "silicon." The most common of these are O., oxygen; H., hydrogen, and N. nitrogen. The name of a compound substance generally indicates the elements of which it is composed. Thus the name "ferric oxide" indicates that the red powder is made up of oxygen and iron; the name "lead sulphide" (galena) that it is composed of sulphur and lead. In the first case the adjective is derived from the Latin name of the metal. When two elements combine with each other in more than one proportion or equivalent, the names of the compound bodies are contrived to express this. Thus, oxygen combines with a number of elements to produce with each a series of acid compounds, the more highly oxidized of which receive the termination *ic*, while those containing less oxygen end in *ous*. Thus sulphuric acid contains three equivalents of oxygen to one equivalent of sulphur, and sulphurous acid two equivalents of oxygen with one equivalent of sulphur. "Ferrous chloride" indicates the lower chloride, and "ferric chloride" the higher chloride, of the metal iron. When acids combine with bases or metallic oxides to form salts they produce compounds the names of which are influenced by the terminations of the acids. Thus, sulphuric acid and sodium form sodium sulphate; sulphurous acid and sodium, sodium sulphite. In the same manner nitric acid combined with potassium forms potassium nitrate, while nitrous acid and potassium produce potassium nitrite. Another method, and one which is growing in favor, is the use of prefixes. Thus, phosphorus unites

either with three or five atoms of chlorine and the compounds are known as phosphorus trichloride and phosphorus pentachloride, respectively. Similarly, carbon monoxide contains one atom of oxygen, carbon dioxide, two atoms, and so on.

Chemical Symbols.—A symbol denotes one atom of the element. Thus, O signifies one atom, or 16 parts by weight, of oxygen; C, one atom, or 12 parts by weight, of carbon; H, one atom, or one part by weight, of hydrogen.

A molecule is composed of various numbers of atoms. For instance, a molecule of hydrogen contains two atoms, and its symbol is therefore written H_2 . The molecule of oxygen also consists of two atoms and is written O_2 . But the ozone molecule contains three atoms of oxygen and is written O_3 .

The combination of two elements is represented by placing the symbols for those elements side by side; thus, H_2O signifies two atoms of hydrogen and one atom of oxygen in a state of chemical combination (viz., water), and $NaCl$ is one atom of sodium (Lat. *natron*) united with one atom of chlorine (viz., common salt). When two or more atoms of one element unite with one or more atoms of another element the number of such atoms is signified by a small figure placed immediately after the symbol of the element so multiplied. Thus MnO_2 is one atom of manganese with two of oxygen (black oxide of manganese), Fe_2O_3 is two atoms of iron with three atoms of oxygen, and Pb_3O_4 is three atoms of lead with four atoms of oxygen (red lead). In expressing the formula of a compound substance the symbol of the metal or its analogue is generally placed first in order, and is succeeded by the oxygen, chlorine, or similar element. The same order is carried out in the construction of the formula of more complex substances; the metallic half is placed first. Thus, ferrous sulphate — containing sulphuric oxide and the oxide of iron — is generally expressed as $FeSO_4$. In other words, the symbols are written in the order in which the substances would be named in Latin.

Some substances contain so-called *compound radicles*, consisting of two or more atoms, combined together to act as a single atom within the molecule. Ammonia is a well-known example of this. The formula for ammonia gas is NH_3 , and in aqueous solution it combines with water to form ammonium hydroxide, (NH_3) OH. The radicle (NH_3) exists in many compounds and whereas it is plainly built up of one atom of nitrogen and four of hydrogen, it acts as though it were a single atom. For instance, we

saw above, that the formula for ferrous sulphate was FeSO_4 . The formula for ammonium sulphate is $(\text{NH}_4)_2\text{SO}_4$, and, to express the fact that the atoms of nitrogen and hydrogen forming ammonium act as a single entity, parentheses are used, as shown. These symbols and formulæ are valuable and necessary because they enable us to express briefly the exact composition of a substance, and because, by their use, chemical reactions can be shortly expressed in the form of an equation. Thus:

$\text{CaCO}_3 + \text{H}_2\text{SO}_4 = \text{CaSO}_4 + \text{H}_2\text{O} + \text{CO}_2$

indicates that calcium carbonate reacts with sulphuric acid to give calcium sulphate, water and carbon dioxide.

Metals.—Largely from their physical characteristics, a number of the elements are called metals. They all possess the metallic luster, are of opposite affinity to oxygen, can within certain limits for each case replace hydrogen in acids and other metals in salts. They conduct electricity and heat comparatively well, and are generally solid at an ordinary temperature.

Non-metals.—All the other elements are classed as non-metals. Some are solid, such as sulphur and iodine; bromine is liquid, and many are gaseous at ordinary temperatures, such as oxygen and chlorine. Some elements are on the border line, such as silicon and arsenic, it being hard to class such definitely as metals or non-metals.

Chemical Laws.—By many years of patient research the chemists of the late 18th and early 19th century established the fact that all chemical reactions take place in accordance with definite quantitative laws. The first and simplest chemical law is known as the *Law of Constant Proportions*. This states that: “*The same compound always contains the same elements combined together in the same proportion by weight.*” This law establishes the difference between a chemical compound and a mixture. A mixture may obviously be compounded of its ingredients in varied proportions. Putty, for instance, may contain more or less whiting, more or less oil, and still it will be putty. But calcium carbonate, which is the chief constituent of whiting, will always contain calcium, carbon, and oxygen combined in the same proportions. It may be dug from the earth as calcite, or prepared artificially by treating lime with carbonic acid, or obtained as a precipitate by treating sodium carbonate solution with calcium chloride, but, however obtained, it will always contain 40 parts of calcium to 12 parts of carbon and 48 parts of oxygen.

Another fundamental law is the *Law of*

Multiple Proportion, which states that: “*When one substance unites with another in more than one proportion, these different proportions bear a simple ratio to one another.*” This law was first established by Dalton. We have already seen that it sometimes happens that the same elements combine to form different compounds. Oxygen will unite with sulphur to give sulphur dioxide, or sulphur trioxide. In the first, 32 parts of sulphur combine with 32 parts of oxygen; in the second 32 parts of sulphur combine with 48 parts of oxygen. The ratio of the different weights of oxygen which will combine with 32 parts of sulphur is, therefore, 32 : 48 or 1 : 1.5. Similarly, nitrogen will combine with oxygen to give nitrous oxide, nitric oxide and nitrogen trioxide. In the first compound, 14 parts of nitrogen combine with 8 parts of oxygen; in the second, 14 parts of nitrogen with 16 parts of oxygen; in the third, 14 parts of nitrogen with 24 parts of oxygen. Here, the ratio of the different weights of oxygen which combine with a definite weight of nitrogen is 8 : 16 : 24 or 1 : 2 : 3. A simple ratio, as illustrated in these two examples, is found in every similar case, thus establishing the second law of chemistry. The third law is called the *Law of Reciprocal Proportions*, and states “*The weights of different elements which combine separately with one and the same weight of another element are either the same as, or simple multiples of, the weights of these different elements which combine with each other.*” To make this clear, let us take a concrete example. Hydrogen, oxygen, and chlorine will all combine with sulphur. In the case of hydrogen, two parts combine with 32 of sulphur, in the case of oxygen, 32 parts with 32 parts of sulphur, and in the case of chlorine, 35.5 parts with 32 parts of sulphur. Now let us see what the law of reciprocal proportions would lead us to infer from these figures. The weights of the three elements given above, which combine with the same weight of sulphur, are 2, 32 and 35.5, respectively. If any two of these elements combine with each other, therefore, we should expect the weights which combine to be either the same as the above or simple multiples of them. Let us take the first two, hydrogen and oxygen. Two parts of hydrogen combine with 16 parts of oxygen, and 16 is exactly one-half of 32. Take hydrogen and chlorine. Two parts of hydrogen combine with 71 parts of chlorine, and 71 is exactly twice 35.5. We see, therefore, that the law holds good, and the same will be found true no matter what elements are considered.

An examination of these three laws led Dalton to formulate the *Atomic Theory of Matter*, although other chemists before him had put forward from time to time a similar hypothesis. Expressed briefly, the theory is that matter is made up of minute particles called atoms, and that chemical combination takes place between these atoms. Atoms of the same element are similar to one another and equal in weight, and compounds are formed by the union of atoms of different elements in simple numerical proportion— $1 : 1, 1 : 2, 2 : 3, 5 : 1$, and so on. This theory forms the basis of quantitative chemical work, and modern chemistry offers an overwhelming mass of evidence that the theory is true.

The Status of Chemistry. The importance of chemistry in daily life can scarcely be over-estimated. Most of our industries are largely dependent upon it, including the manufacture of iron and steel, paper, glass, photographic materials, oils, drugs, dyes, explosives, soaps, concrete, paint, perfumes, and many others. The manufacture and application of fertilizers forms the connecting link between this science and the farm, and the preparation of foodstuffs, flavorings, and essences brings chemistry into the kitchen. Some knowledge of chemistry, moreover, is a necessity to the physician, the engineer, or the electrician. It is, therefore, clear, that modern existence is more dependent upon chemistry than upon any other science.

CHEMISTRY, AGRICULTURAL. See AGRICULTURAL CHEMISTRY.

CHEMISTRY, ANIMAL. See ANIMAL CHEMISTRY.

CHEMISTRY, INDUSTRIAL. Chemistry of Manufactures.

CHEMISTRY, PHYSIOLOGICAL. Chemistry of Living Organisms.

CHEMNITZ, a town of Saxony, at the base of the Erzgebirge, and at the confluence of the Chemnitz river with three other streams, 51 miles S. S. E. of Leipzig. It is the principal manufacturing town of Saxony—the “Saxon Manchester” its townsfolk call it—its industry consisting in weaving cottons, woolens, and silks, and in printing calicoes, chiefly for German consumption. It supplies the world with cheap hosiery, and makes mixed fabrics of wool, cotton, and jute for the markets of Europe and the United States. It has several extensive machine-factories, producing locomotives and other steam-engines, with machinery for flax and wool spinning, weaving, and mining industry. Created a free imperial city as early as 1125,

Chemnitz suffered much during the Thirty Years’ War. Pop. about 300,000.

CHEMULPO, a town on the W. coast of Korea, 25 miles by road W. S. W. of the capital, Seoul. It is one of the three treaty ports opened in 1883 to foreign commerce, the volume of which has since steadily advanced, in spite of the drawbacks resulting from the great difference between high and low water here (33 feet), and the want of wharves. Pop., about 30,000; the bulk of the foreigners are Japanese. Small steamers owned by Japanese run to Seoul in summer, and Chemulpo is connected by telegraph both with China and Japan.

CHEENEY, CHARLES EDWARD, an American clergyman; born in Canandaigua, N. Y., Feb. 12, 1836. He was graduated at Hobart College in 1857, and, after a course at the Theological Seminary of Virginia, was ordained a clergyman of the Protestant Episcopal Church in 1858. Becoming rector of Christ Church, Chicago, he incurred censure for heterodoxy and was tried on that charge and deposed from the priesthood. He at once became a leader in the Reformed Episcopal movement, and was consecrated bishop of the new denomination in 1873, a post he continued to hold, as well as the rectorship of Christ Church. He died in 1916.

CHEENEY, EDNAH DOW (LITTLE-HALE), an American writer; born in Boston in 1824. She was president of the New England Woman’s Club and the Massachusetts Suffrage Association. She wrote “Handbook of American History for Colored People”; “Life of Louisa M. Alcott”; and several stories, besides other books. She died in 1904.

CHÉNIER, ANDRÉ MARIE DE (shā-nyā'), a French poet; born in Constantinople, Oct. 30, 1762. Shortly before the Terror he made a vigorous attack on the Jacobins in the “Journal de Paris.” He wrote Louis XVI.’s appeal to the people after the death sentence. He celebrated in verse Charlotte Corday. He perished under the guillotine July 25, 1794.

CHENONCEAUX (shā-nôñ-sô'), a famous French château, standing partly on an island in the Cher, partly on a bridge spanning the river, near a station 20 miles E. by S. of Tours. It was begun in 1524 by the Chancellor Thomas Bohier, continued by Diana of Poitiers, and completed by Catharine de’ Medici, who richly embellished the building and surrounded it with a beautiful park. It passed into private hands. The castle is in excellent preservation.

CHENSTOCHOW, a town of Poland, near the left bank of the Warthe river. It is on the Warsaw-Vienna railway. Prior to the World War the town was of considerable industrial importance, containing cotton mills, iron foundries, breweries, flour mills, etc. Near by is the famous monastery of the order of St. Paul the Hermit, visited annually by many thousands of pilgrims. Pop. about 75,000.

CHEOPS (kē'ops), the name given by Herodotus to the Egyptian despot whom the Egyptians themselves called Khufu. He belonged to the rulers who had for their capital Memphis; lived about 2800-2700 B. C., and built the largest of the pyramids. According to Herodotus he employed 100,000 men on this work constantly for 20 years.

CHEPHREN, or **CEPHREN** (kef'rēn), was the successor of Cheops as King of Egypt, and the builder of the second pyramid. His name is properly Khafra.

CHEPSTOW, a town and port in England, Monmouthshire, on the Wye, 14 miles N. by W. of Bristol. The high tides of the Wye allow large ships to reach the town, which is very ancient, and has a castle, portions of which date back to the Conquest.

CHER (shār), a department of central France, named from the river Cher, and formed from part of the old provinces of Berry and Bourbonnais; area, 2,819 square miles; capital, Bourges. The surface is in general flat, but is diversified in the N. by chains of inconsiderable hills. Soil various, but fertile in the neighborhood of the Loire and Allier. The forests and pastures are extensive. More grain and wine are produced than the demands of the inhabitants require. The preparations and manufacture of iron, called Berry-iron, is the principal branch of industry. Pop. about 335,000.

CHERASCO (ker-as'kō), a walled town in the province of Cuneo, north Italy, 37 miles S. S. E. of Turin. It markets grain, wine, and truffles. During the Middle Ages Cherasco was one of the chief fortresses of north Italy, but its works were destroyed by the French in 1801. A peace was concluded here between Louis XIII. of France and the Duke of Savoy in 1631, and another between the Sardinian commissioners and Napoleon in 1796. Pop. about 10,000.

CHERBOURG (shār-börg), a fortified seaport and naval arsenal of France, in the department of La Manche,

196 miles W. N. W. of Paris. It is the headquarters of one of the five maritime arrondissements of France and one of the chief torpedo stations. The fortifications are very extensive, and have been greatly strengthened in recent times, so that Cherbourg, if not impregnable from the sea, is at least very difficult of attack. The port is divided into the commercial and naval ports, which are quite distinct. The Port Militaire is accessible at all times of tide for vessels of the largest class; there are slips for vessels of the largest dimensions, dry docks, building-sheds, mast-houses, boiler-works, and in short everything necessary for the building and fitting out of ships of war. There is a great *digue* breakwater, stretching across the roadstead, which, though protected on three sides by the land, was formerly open to the heavy seas from the north. The *digue* was commenced under Louis XVI., is 4,120 yards long, and is 2½ miles from the harbor, in water varying from 42 to 62 feet deep. A fort and lighthouse occupy the center of the *digue*, and there are circular forts at the extremities. The principal industry of the town is centered in the works of the dock-yard, the commercial trade and manufactures being comparatively insignificant, although it is a port of call of several of the largest French, British, and American passenger steamship lines. Cherbourg occupies the site of a Roman station. William the Conqueror founded a hospital in it, and built the castle church. The castle, in which Henry II. frequently resided, was one of the strongholds of Normandy. The town was taken by the British in 1758. During the World War it was of great importance as a military and naval port. Pop. about 45,000.

CHERBULIEZ, CHARLES VICTOR (shār-bü-lya'), a French romancist; born in Geneva, July 19, 1829. Having studied in the universities of Geneva, Paris, Bonn and Berlin, he became in 1864 one of the editors of the "Revue des Deux Mondes." He gained distinction as art critic and observer of public affairs, and by his romances, under the pseudonym "G. Valbert." His romances are characterized by clever treatment of the problems of domestic and social life and a fine psychological analysis, with a marked bias for description of odd characters. Among his most successful novels are: "Romance of a Respectable Woman" (1866); "Ladislas Bolski's Adventure" (1869); "Samuel Brohl & Co." (1877). He died in Combs-la-Ville, June 30, 1899.

CHEROKEE INDIANS, a tribe of the Appalachian family of North American aborigines, which occupied for centuries the country E. and S. of the Alleghenies. After the colonization of North America by the whites, a series of wars broke out at periods ranging from 1759 to 1793; when, by a treaty entered into with the United States, they ceded their territory in the Southeastern States, in consideration of a certain cash payment, and an annual subsidy being continued to them. In 1805 they made further concessions of their lands, and, in 1812, fought bravely on the American side. In 1817-1819 new treaties were made, which resulted in the Cherokees being forced to a reservation of territory afforded them W. of the Mississippi. A remnant of the tribe remained, however, in the original reservation in North Carolina. In the Indian Territory they occupied an area of 7,861 square miles in the N. E. The Cherokees, up to 1906, when they disbanded as a tribe and became citizens of the United States, had a chief, an assistant, and a legislature, all chosen by vote. The total number of Cherokees of pure and mixed blood is about 20,000. In the original North Carolina reservation the Cherokees number about 1,500.

CHERRY, a fruit-tree of the prune or plum tribe, very ornamental and therefore much cultivated in shrubberies. It is a native of most temperate countries of the Northern Hemisphere, and in Great Britain is quite common in the wild state, besides being cultivated for its fruit. The cultivated varieties belong to two species, *Cerasus avium* and *Cerasus vulgaris*, the genus *Cerasus* being considered a sub-genus of *Prunus*. They are numerous, as the red or garden cherry, the red heart, the white heart, the black cherry, etc. The fruit of the wild cherry, or *gean*, is often as well flavored, if not quite so large, as that of the cultivated varieties. It is said that this fruit was brought from Cerasus, in Pontus, to Italy, by Lucullus, about 70 B. C., and introduced into England by the Romans. The cherry is used in making the liqueurs Kirschwasser and Maraschino. The wood of the cherry-tree is hard and tough, and is very serviceable to turners and cabinet-makers. An ornamental but not edible species is the bird-cherry. The American wild cherry (*Cerasus virginiana*) is a fine large tree, the timber of which is much used by cabinet-makers and others, though the fruit is rather astringent.

CHERSONESE (ker'zon-ēz), a peninsula; united by an isthmus to the mainland. There were many Chersonese, of

which the most celebrated are the Peloponnesus; the Thracian, at the S. of Thrace and W. of the Hellespont, where Miltiades led a colony of Athenians, now the PENINSULA OF GALLIPOLI (q. v.); the Taurica, now the Crimea, situate near the Palus Maeotis; the fourth, called Cimbrica, now Jutland, and the fifth, surnamed Aurea, now Malacca, in India, beyond the Ganges.

CHESAPEAKE BAY, in Maryland and Virginia, and dividing the former State into two parts, is the largest inlet on the Atlantic coast of the United States, being 200 miles long, and from 4 to 40 broad. Its entrance, 12 miles wide, has on the N. Cape Charles, and on the S. Cape Henry, both promontories extending in Virginia. The bay has numerous arms, which receive many navigable rivers, such as the Susquehanna on the N., the Potomac, Rappahannock, and York on the W., and the James on the S. W. Unlike the shallow sounds toward the S., this network of gulfs and estuaries, with its noble feeders, affords depth of water for ships of any burden, virtually carrying the ocean up to the wharves of Baltimore and the arsenal of Washington.

CHESHIRE, a maritime county, situated in the west of England. It has an area of 1,027 square miles. Its surface is mainly level and it is occupied by grazing and dairy land, among the most important in England. The chief industries are connected with dairying and agriculture. There is also a considerable amount of manufacturing. Rock salt and coal are produced. The chief towns are Chester, the county town; Stockport, Knutsford, and Birkenhead. Pop. about 680,000.

CHESNEY, FRANCIS RAWDON, an English explorer, was born in Annalong, County Down, Ireland, in 1789. He was gazetted to the Royal Artillery in 1805. In 1829 he inspected the route for a Suez canal, which he proved to be practicable. His first exploration of the route to India, by way of Syria and the Euphrates, was made in 1831, and he made three other voyages with the same object. The idea was taken up by government, who made a grant of £20,000 after his first expedition, but owing to the opposition of Russia it was never brought to a practical issue. He commanded the artillery at Hong-kong from 1843 to 1847. In 1850 he published his "Expedition for the Survey of the Rivers Euphrates and Tigris," and in 1868 a "Narrative of the Euphrates Expedition." He died in Mourne, Jan. 30, 1872.

CHESS, the most purely intellectual of all games of skill, the origin of which has

been much disputed; this much may now be considered as certain, that, under the Sanskrit name of *Chaturanga*, a game, essentially the same as modern Chess, was played in Hindustan nearly 5,000 years ago. From Hindustan, Chess spread into Persia and thence into Arabia. The Arabs, it would appear, in the 8th century, introduced the game into Spain and the rest of western Europe; and in England Chess-play seems to have been known prior to the Norman Conquest. Into Constantinople, and probably some other cities of eastern Europe, the game may have been imported from Persia at a period earlier than its Moorish conveyance into Spain.

CHESTER, an ancient and episcopal city, municipal and parliamentary borough, the capital of Cheshire, England, on the Dee, 16 miles S. E. of Liverpool. The two main streets cross each other at right angles, and were cut out of the rock by the Romans 4 to 10 feet below the level of the houses. The houses in these streets were curiously arranged; the front parts of their second stories, as far back as 16 feet, form a continuous paved promenade or covered gallery, open in front, where there are pillars and steps up from the street below, with private houses above, inferior shops and warehouses below, and the chief shops of the town within. St. John's Church, now partially in ruins, is supposed to have been founded by Ethelred in 698. There are a famous cathedral and many other ancient buildings, making Chester one of the most picturesque towns in England. Modern improvements, however, have been made in every respect. The chief trade of the town is in cheese. There are numerous industrial establishments and good railroad connections. The title Earl of Chester was bestowed by Henry III. on his eldest son and has since then been held by each Prince of Wales. Pop. about 40,000.

CHESTER, city and port of entry of Delaware co., Pa.; on the Delaware river, and the Pennsylvania, the Baltimore and Ohio, the Philadelphia and Reading, and the Southern Traction Co. railroads, 15 miles S. of Philadelphia. The favorable location and excellent shipping facilities of the city have given it a diversity of industries.

Chester is the local trade center of a very prosperous agricultural and manufacturing district. It is the site of the Roach ship yards, where several vessels of the United States navy have been built. According to the Federal census of 1914 Chester had 153 manufactories, employing 7,127 hands. The principal industries were ship-building, foundry

and machine-shop work, and the manufacture of cotton, locomotives, paper, cigars, silk, woolen and worsted goods. In 1919 there were 4 National banks.

Chester is connected with Media, Darby, and other surrounding towns by electric railways. It is the seat of the Pennsylvania Military College and Crozier Theological Seminary, and Swarthmore College is near by. The notable buildings are the United States Government Building, including the postoffice; the City Hall, erected in 1724, of great historic interest; Chester and Homoeopathic Hospitals, and the Public Library.

Chester was settled by the Swedes in 1643, under the name of Upland, and is the oldest town in the State. It was incorporated in 1866. Pop. (1910) 38,537; (1920) 58,030.

CHESTER, GEORGE RANDOLPH, an American author; born in Ohio, in 1869. He left home at an early age, worked as reporter on the Detroit "News" and Cincinnati "Enquirer," but later gave himself entirely to the writing of books and stories for the magazines. His reputation as a writer is based chiefly on his "Get-Rich-Quick Wallingford" stories, concerned with the swindling adventures of a confidence man. He has also written "Early Bird" (1910); "Five Thousand an Hour (1911); etc., and (in collaboration with his wife, Lillian Chester) "The Ball of Fire" (1914); "Runaway June"; and "The Enemy" (1915).

CHESTERFIELD, a borough and market town of Derbyshire, England. It is at the junction of the Hipper and Rother rivers. There are important manufactures of cotton, silk, machinery, and earthenware. In the neighborhood are important deposits of coal, clay, slate, and lead. A canal connects Chesterfield with the Trent river. It is also on the main line of the Midland railway. It contains an ancient grammar school, a technical school, and a public library. Pop. about 45,000.

CHESTERFIELD, PHILIP DORMER STANHOPE, 4th Earl of, an English statesman and litterateur; born in London, Sept. 22, 1694. After studying in his youth with a zeal of which he afterward thought proper to be ashamed, he learned on the Continent of Europe his polished smoothness of manners, his love of gaming, and his loose code of morality. He entered public life in 1715, and took an active part in the petty intrigues and party squabbles which make up the parliamentary and court history of the reign of George II. His diplomatic skill was made useful in two foreign embassies; and his lord-lieutenancy

in Ireland in 1745, though lasting only a few months, has always been mentioned with distinguished praise. His "Letters" to his natural son are remarkable for their ease of style and their knowledge of society, but notoriously reprehensible for the principles of conduct which they inculcate. He died March 24, 1773.

CHESTERTON, CECIL EDWARD, an English author; born at Kensington, Nov. 12, 1879. He was educated at St. Paul's School and entered journalism in 1901. He wrote at first for the "Outlook" and later contributed to a large circle of magazines and journals. He tended toward radicalism in politics, and his energies were largely devoted to the exposure of corruption and inefficiency in public life. He founded the "New Witness" in 1912, and continued in the editorship until 1916. He served during the World War in the Highland Light Infantry. Among his publications are: "Gladstonian Ghosts" (1905); "Party and People" (1910); "The Prussian Hath Said in His Heart" (1914); and "The Perils of Peace" (1916). He died in 1920.

CHESTERTON, GILBERT KEITH, a British author and journalist; born at Kensington in 1874. He received his education at Slade School, and soon developed a marked bent for writing. He speedily became noted for his wit and his paradoxical style as well as for his wide range of information. Besides his contributions to periodicals he wrote many books, of which the most notable were: "Browning" (in *English Men of Letters Series*) (1904); "Heretics" (1905); "The Man Who Was Thursday" (1908); "The Ball and the Cross" (1910); "The Wisdom of Father Brown" (1914); "A Short History of England" (1917).

CHESTNUT, a genus of plants, order *Cupuliferae*, allied to the beech. The common or Spanish chestnut (*Castanea vesca*) is a stately tree, with large, handsome, serrated, dark-green leaves. The fruit consists of two or more seeds enveloped in a prickly husk. Probably a native of Asia Minor, it has long been naturalized in Europe, and was perhaps introduced into Great Britain by the Romans. The tree grows freely in Great Britain, and may reach the age of many centuries. Its fruit ripens only in some cases, however, and the chestnuts eaten in Great Britain are mostly imported. Chestnuts form a staple article of food among the peasants of Spain and Italy. The timber of the tree was formerly more in use than it is now; it is inferior to that of the oak,

though very similar to it in appearance, especially when old. Two American species of chestnuts, *C. americana* and *C. pumila* (the latter a shrub), have edible fruits. The former is often regarded as identical with the European tree. The name of Cape Chestnut is given to a beautiful tree of the rue family, a native of Cape Colony. The Moreton Bay Chestnut is a leguminous tree of Australia, *Castanospermum australe*, with fruits resembling those of the chestnut. The water-chestnut is the water-caltrop, *Trapa natans*. The horse-chestnut is quite a different tree from the common chestnut.

CHEVALIER (she-vä-lyä'), an honorary title given, especially in the 18th century, to younger sons of French noble families. Both the Old and Young Pretender were called the Chevalier by their partisans. In a general way it is used with the same significance as KNIGHT (q. v.).

CHEVALIER, ALBERT, a London comedian; born March 21, 1861. He appeared on the stage in public when only eight years old, and subsequently took part in plays with Mr. and Mrs. Kendal, John Hare, and other eminent players. His greatest success however, was achieved appearing singly in vaudeville houses and music halls, in the character of a London coster. His characterization of this product of the British metropolis was so amusing and true to life as to create a furore. He was the author of more than a hundred monologues, sketches, and plays.

CHEVY CHASE, the name of a celebrated British Border ballad, which is probably founded on some actual encounter which took place between its heroes, Percy and Douglas, although the incidents mentioned in it are not historical. There are two versions of the ballad bearing the name of "Chevy Chase," an older one, originally called "The Hunting of the Cheviot," and a more modern one. From the fact that the older version is mentioned in the "Complaynt of Scotland," written in 1548, it is clear that it was known in Scotland before that time. The age of the more modern version is believed to be not later than the reign of Charles II. This is the version which forms the subject of the critique by Addison in Nos. 70 and 74 of the "Spectator."

CHEYENNE, city, capital of the State of Wyoming, and county-seat of Laramie co.; on the Union Pacific, the Colorado and Southern, and Burlington Route railroads, 105 miles N. of Denver.

Cheyenne is situated on a plateau 6,075 feet above the sea. Fort Russell, a United States military post, is within a few miles of the city. It has the main repair shops of the Union Pacific railroad, a fine State House, water works, electric lights, a public library, high school, and 3 National banks, and is the great beef growing center, the shipping point for beef-cattle to Eastern markets, and the supply depot for the trade of the Rocky Mountain region. The annual "round up" attracts many visitors. Pop. (1910) 11,320; (1920) 13,829.

CHEYENNES, a tribe of American Plains Indians, originally of Algonquin stock, at one time settled in Wyoming. From 1861 to 1867 the United States government had "wars" with them. There are about 3,000 who are settled on reservations in Oklahoma and Montana.

CHHATISGARH, the S. E. division of the Central Provinces of India, with an area, including feudatory states, of 21,240 square miles; pop. about 3,500,000. It is mainly a vast fertile plateau, and has of late become a great center of the Indian grain trade. Dongargáon is the capital.

CHIANA (kē-ä'nä; ancient, *Clanis*), a river of central Italy, originally a tributary of the Tiber, watering the perfectly level Val di Chiana, which its overflow rendered once the most pestilential district of Italy. The bed was deepened in 1789-1816, and in 1823 extensive hydraulic works were undertaken for further improving the river course, and for leading a N. branch, through canals, to the river Arno, a few miles below Arezzo, the S. stream reaching the Tiber through the Paglia at Orvieto. The double stream is 60 miles long, and 1½ to 1 mile broad; and the district has since become one of the most fruitful in all Italy.

CHIANG-HSI, or Kiang-Si, an inland province of China. It is bounded N. by Hu-Pei (Hu-Peh) and Ngan-Hui (An-Hui); E. by Cheh-Chiang (Cheh-Kiang) and Fu-Chien (Fo-Kien or Fuh-Kien); S. by Kwang-Tung; and W. by Kwang-Si and Hu-Nan (Ho-Nan). The area is 69,480 square miles. Pop. about 17,000,000. Capital, Nan-Chang. The province contains the treaty port of Kiukiang (pop. about 55,000), on the Yangtze-Kiang. The Nan Ling or Southern Mountains traverse the E. half of Chiang-Hsi, and in the N. is the large inland lake of Po-Yang-Hu. Here are established famous manufactories of porcelain. The principal river, aside from the Yangtze-Kiang, is the Kin-Kiang. The

province produces tea and silk, besides porcelain, and has important mineral deposits.

CHIANG-SU or **KIANG-SU**, an important maritime province of China proper, bounded N. by the province of Shan-Tung; E. by the Yellow Sea; S. by the province of Cheh-Chiang, and W. by the provinces of Ngan-Hwei (An-Hui) and Ho-Nan. Chiang-Su has an area of 38,600 square miles and a population estimated at 16,000,000. The great commercial importance of this province is denoted by its possession of four treaty ports: Shanghai, Nanking, Su-Chow, and Chin-Kiang. Chiang-Su was in fact the first province opened to foreign commerce by means of a treaty port. It is traversed almost its whole length by the Grand Canal, the ancient Chinese system of waterways.

The Yang-tze-Kiang empties into the sea through this province and enables it to control the trade of all southern China. There are large cotton mills. Vessels from all parts of the world touch at SHANGHAI (*q. v.*). The capital of the province is Nanking, which was formerly the capital of the Chinese Empire. The Tai-Ping rebellion of 1853-1854 had its headquarters in this province. Chiang-Su is the center of Chinese manufacturing industries, especially in textiles. Commercially, the province is controlled by the English, who have invested largely in railways, mills, and government concessions.

CHIAPAS, a State of the Republic of Mexico, on the Pacific slope, having an area of 27,527 square miles and a pop. of about 500,000. The capital, Tuxtla Gutiérrez (pop. about 10,000) is also the principal town. The State is in many parts mountainous, and is also in many parts traversed by noble streams, including the Rio Chiapas. At Palenque are the ruins of an ancient Aztec city of great beauty and magnitude. The valleys have a rich soil and produce maize, sugar, cotton, etc. Trade is, however, in a backward state for lack of roads. The State forms part of the Central American tableland, and has a fine climate, although the whole region is largely clothed in primeval forests.

CHIARI (kē-är'ē), a town of Lombardy, 13 miles W. of Brescia by rail, with manufactures of silk. At one time strongly fortified, it is memorable for the victory here of the Austrians, under Prince Eugene, over the French and Spaniards, under Villeroi, Sept. 2, 1701. Pop. about 15,000.

CHIBOUCHE (shē-bök'), a Turkish pipe with a long stem.

CHICAGO, city, port of entry, and county-seat of Cook co., Ill.; second city in population in the United States. It is built on the S. W. shore of Lake Michigan, about 18 miles N. of its S. extremity. It is the center of the Western and Lake commerce and has a large water front of 30 miles. A portion of the N. shore is protected by a massive wall. The city is one of the greatest commercial centers, and is connected by steamship and railroad lines with all parts of the world. The lake shore is protected by breakwaters, forming a splendid harbor at the mouth of the Chicago river. The exterior breakwater is 5,436 feet long, and extends in a N. E. and S. W. direction about one mile from the shore. Piers and breakwaters, built as continuations of the shores of Chicago river, form a harbor of about 455 acres, with an average depth of 16 feet. At the mouth of the Calumet river, in South Chicago, is another harbor 300 feet wide between piers. The Erie canal, terminating at Buffalo, provides a means of commercial communication with the Atlantic ports. Area, 199.37 square miles; pop. (1890) 1,099,850; (1900) 1,698,575; (1910), 2,185,283; (1920) 2,701,705.

Topography.—The city was built originally on the flat prairie, at an elevation too low to secure proper drainage. When this became apparent the grade of the whole city was raised 7 feet and the streets and buildings brought to the new level. The Chicago river traverses the city, and by its peculiar course divides it into three sections, known as the North, South, and West Sides, which are connected by many bridges and tunnels.

Commerce.—Chicago is the commercial distributing center of the country; it is the heart of the greatest producing region of the country and the greatest railway center in the world. It is the principal center of the world's meat packing industry; it is the world's greatest live stock, grain, and lumber market; it leads all other cities of the country in the distribution of dry goods, general merchandise, foodstuffs, machinery, jewelry, musical instruments, wearing apparel, automobiles, furniture, and household articles. With few exceptions it holds a commanding place in every American industry.

Chicago's estimated earning power is \$1,000,000,000 a year. It has more than 30,000 factories and its manufacturing zone has a normal output of \$6,500,000,000 a year. Its wholesale trade is fully as large, while its lumber receipts are 2,329,071,000 feet a year.

The city has one hundred and one miles of water front, of which fifty-two miles are equipped with both dock and

railway facilities. In 1919 its lake trade, comprising vessel arrivals and clearances from the Chicago district, was 60,769,-234 tons. It is the terminus of thirty-nine railways and has 1,400 miles of belt line. Its railway yards number more than 100, one having a capacity of 10,000 freight cars a day. Another railway is now building the largest freight yard in the world.

Chicago is in close commercial touch with every producing and consuming region of the country. Because of its central position and its unequalled railway facilities it is the natural market place for a vast part of the North American continent and products manufactured elsewhere find here their natural distributing point. Thus, more automobiles are sold from Chicago than from any other city although Chicago is not the center of the automobile manufacturing district. The same is true in many other lines.

The city's foreign trade is close to \$2,000,000,000 a year. Federal government figures show the city's foreign trade as being about \$100,000,000 a year. The reason for this is that the government gives credit for shipments to the port of entry, or exit. Therefore the seaboard cities get entire credit for the business that is really done in Chicago, and merely passes through these ports. Under the British system, credit for foreign trade goes to the point of origin, not to the city through which the business happens to pass on its way to its destination. This method makes it possible to find out exactly what each city of England is doing in originating business. Were such a system in force in the United States Chicago's export business would be shown to be close to two billion dollars annually.

The packers and the manufacturers of agricultural machinery are among Chicago's heaviest exporters and their products are shipped all over the world. Many other lines likewise have many foreign markets and a movement is on foot to have "made in Chicago" stamped on all products of this market that the city's importance as a producing center may be brought home to the rest of the world.

Chicago commerce will be greatly increased with the completing of the various waterway plans, especially south through the Mississippi and eastward by way of the Great Lakes and the St. Lawrence river.

Finance.—Chicago has made great strides as a financial center in recent years. Its bank clearings now run more than \$100,000,000 a day and its banks share with those of New York City in

the most important financial undertakings of the day. The Continental and Commercial National Bank has a capital of \$25,000,000, a figure surpassed by no bank in America and equaled only by two, both of which are in New York City. The city has, in all, 150 banks; of these 27 are National and 123 State institutions. They have a capital of approximately \$125,000,000 and surplus and excess profits of about \$113,000,000. No other city in the country, except New York, has larger resources, although the banking history of Chicago dates back only to 1837 when the first bank charter was issued.

Not only has the number of banks in the city increased rapidly in recent years but the size of the individual institutions has grown remarkably. In addition to the Continental and Commercial National, already mentioned, the First National has just increased its capital to \$12,500,000 and a great new bank, or rather two associated banks, is in process of formation, being the consolidation of the Corn Exchange National, the Merchants Loan & Trust Company and the Illinois Trust and Savings Banks. These will be called the Corn Exchange National and the Illinois Merchants Trust, the latter being the State bank.

Chicago banks in 1920 had out in loans and discounts the sum of \$1,575,640,158. Deposits stood at \$1,825,576,473. Of these deposits \$443,840,093 is represented by savings accounts. The total assessed realty valuation of Chicago in 1920 was \$1,653,171,362. The net funded debt (less sinking fund) was \$53,624,924. The annual budget was \$131,943,672. The tax levy was \$84,973,008. Cash resources were \$514,770,161.

Education.—Chicago had in 1920 305 public schools with 377,058 pupils and 8,558 teachers. It has numerous universities and colleges of high rank, its two largest, the University of Chicago and Northwestern University, having more than 15,000 students. The city is a great medical school center, containing some of the highest rank in the country. It has very many special schools of all kinds and the art school of the Art Institute of Chicago is one of the largest in America.

The city's progress in education has been as rapid as its development along other lines. Thus, in 1841 the public school enrollment was only 410 and the teachers numbered 5. In small parks and play grounds which are closely connected with the school system of the city, Chicago is unsurpassed by any American city.

The University of Chicago, founded in 1890, now has an endowment of \$30,000,000 while its total assets in land, buildings, and securities exceed \$50,000,000. Northwestern University, a much older institution, was organized in 1850. It recently has undertaken a campaign to raise \$25,000,000, a part of which will be used to create a magnificent educational center for its medical and other professional schools on the lake shore.

Chicago is particularly proud of its libraries. Chief among them from the popular point of view is the public library, which was started in the years following the great fire of 1871 with books sent from England. The library now contains more than a million books with an aggregate circulation during the last fiscal year of 995,000 volumes. This does not include books on the open shelves or books consulted in the reference rooms. The calls for books in reference use numbered 744,991 during 1919.

The Newberry is a free reference library including in its scope books on history, literature, religion, philosophy, biography, language and the fine arts. The library has undertaken the task of photographing entire series of rare books in some of the great European libraries, thus bringing to American students a mass of material hitherto beyond their reach.

Another of Chicago's great libraries is the John Crerar, a reference institution chiefly scientific and technical, and containing 400,000 books, 150,000 pamphlets and an immense number of maps and periodicals. Its collection of works on labor and the American labor question is one of the finest in the country. Its largest section is that of medicine.

The Harper Memorial Library at the University of Chicago includes more than 500,000 books. Other important libraries in the city are the Ryerson at the Art Institute, the Chicago Historical Society, and that of the Field Museum of Natural History.

Chicago has many important musical institutions, including the Grand Opera Association and the Symphony Orchestra, founded by Theodore Thomas. Among other leading musical organizations in the city are the Apollo Musical Club, the Civic Music Association, the Mendelssohn Club, the Musicians' Club and the Glee Club of the Chicago Association of Commerce.

Public Buildings.—The total number of churches, chapels and missions in Chicago is 1,200. Its resident church dignitaries include a Roman Catholic archbishop and bishops of the Method-

ist, Episcopal, and other Protestant denominations. The Y. M. C. A., the Y. W. C. A., the Salvation Army, the Knights of Columbus, and similar organizations play an important part in the city's life. There are divinity schools at the University of Chicago and Northwestern University. The city is one of the chief centers of the Christian Science church. There are two Jesuit colleges in the city, St. Ignatius and Loyola. The Jews have many fine synagogues throughout the city.

The terrible conflagration that visited Chicago in 1871 was a blessing in disguise, for it cleared away the hastily built and inadequate buildings dating from the pioneer period and enabled it to be rebuilt on a scale commensurate with its commercial destiny. Its municipal utilities, water works, lighting, transportation, fire protection and sewerage systems are not surpassed by those of any city in the country. It has a magnificent park and boulevard system connecting all parts of the city. A superb driveway runs north along the Lake shore to Fort Sheridan, twenty-five miles distant. The city is noted for the size, height and beauty of its public and business buildings, among which may be noted the Auditorium, the Coliseum, the Blackstone Hotel, the Stock Exchange, the Masonic Temple, the Public Library, while beautiful homes abound in the choice residential sections of the city.

History.—The site of Chicago was first visited by Joliet and Marquette, French missionaries and explorers, in 1673. In 1685 a fort was built there commanded by an officer in the Canadian service and before the end of the 17th century the Jesuits made it a mission post. Indian hostilities prevented further occupation till the United States Government established there the frontier post of Fort Dearborn in 1804, which was destroyed by Indians in the War of 1812, but rebuilt in 1816, when a permanent settlement began. In 1830 the population was only 70 persons, but in 1835 a town was organized, and in 1837 it was incorporated as a city with 4,000 inhabitants and an area of 10 square miles. On Oct. 8 and 9, 1871, occurred the memorable fire which reduced the greater part of the city to ashes, destroyed its entire business center, and swept over an area of more than three square miles, causing a loss of about \$190,000,000. Nearly 20,000 buildings were consumed, 100,000 people were made homeless, and 200 lives were lost. Another disastrous fire broke out in 1874 in the heart of the city, which con-

sumed 18 blocks and over 600 homes, with a loss of over \$4,000,000. Within a very short time after these disasters Chicago was rebuilt in a much more substantial and elegant manner, and it has since continued its steady march to prosperity. In May, 1886, anarchist riots at the Haymarket resulted in the death of six police officers, the wounding of several others, the conviction of eight rioters, and the execution of four. The World's Columbian Exposition was held in Chicago from May 1 to Oct. 30, 1893.

CHICAGO DRAINAGE CANAL. See CANAL.

CHICAGO HEIGHTS, a city of Illinois in Cook co. It is on the Chicago and Eastern Illinois, the Elgin, Joliet, and Eastern, and the Michigan Central railroads. The principal industries are the manufacture of iron and steel goods, chemicals, glass, carriages, automobiles, and passenger and freight cars. It has a library and a hospital. Pop. (1910) 14,525; (1920) 19,653.

CHICAGO RIVER, a stream in the city of Chicago, which formerly emptied into Lake Michigan, but which, by the construction of the Chicago Drainage canal, has reversed its direction. The Illinois and Michigan canal connects the Chicago river at Bridgeport with the Illinois river at La Salle, a distance of about 100 miles.

CHICAGO, UNIVERSITY OF, a co-educational (non-sectarian) institution in Chicago, Ill., founded by John D. Rockefeller, dating from Sept. 10, 1890, when the institution was incorporated under the laws of Illinois. A previous institution known as the University of Chicago had gone out of existence, owing to financial difficulties, in 1886. A number of Baptists, which denomination had been interested in the old institution, desired to have a college in Chicago, and succeeded in interesting John D. Rockefeller in the plan. He promised \$600,000 toward the establishment of the college if \$400,000 more should be raised by June, 1890. This amount was duly raised, and the plan was enlarged in scope so as to include a university, instead of a mere college. Further large gifts were made by Mr. Rockefeller and by others, and the doors were opened for instruction Oct. 1, 1892. The site of the University includes six blocks of land, containing about 35 acres. It lies with a frontage on the Midway Plaisance, between Washington and Jackson Parks. A general architectural plan was adopted at the outset, and to this plan new buildings were successively adapted. The

grounds are covered by a series of quadrangles, the buildings, in the English Gothic style, being constructed of gray Bedford stone, with red roofs.

In 1919 there were in the institution a total of 5,650 students. These were divided as follows: Graduate, 681; undergraduate, 2,531; professional, 1,490; university college, 1,219. The faculty comprised 346 members. There were 570,849 volumes in the library. The income for the year was \$1,874,182. The productive funds amounted to \$32,537,886. Harry Pratt Judson, LL.D., was president.

CHICHEN, one of over 50 ruined towns in the Mexican province of Yucatan, a few miles W. S. W. of Valladolid, with the remains of an ancient Indian city, comprising a vast temple with bas-reliefs, a pyramid, houses containing sculptured chambers, etc.

CHICHESTER, a municipal borough of England, in Sussex co. It contains many notable buildings, dating from the 12th and 13th centuries. The former city walls are now used as a public promenade. The cathedral is remarkable for several features. Other notable buildings are the guildhall, the church of St. Olave, and the market cross, erected about the beginning of the 16th century. The town has a theological college and a grammar school. It has considerable trade in agricultural products and live stock. The harbor, about 2 miles S. W. of the city, is connected with it by a canal. Pop. about 15,000.

CHICKAHOMINY, a river in Virginia, affluent of the James and running parallel to it for many miles from its source N. W. of Richmond. As it lay between the Union armies and Richmond, on and near it occurred many of the most important events of McClellan's Peninsula campaign in 1862, including the battles of Williamsburg, Hanover Court-house, Fair Oaks, Mechanicsville, Cold Harbor, Savage's Station, Frazier's Farm, and Malvern Hill. The second battle of Cold Harbor under Grant took place in 1864.

CHICKAMAUGA NATIONAL MILITARY PARK. See PARK, NATIONAL.

CHICKASAW, an Indian tribe, occupying a reservation in Oklahoma. The tribe had a chief and a legislature chosen by popular vote, but its members are now citizens of the United States. Cotton and corn are grown by the tribe. The tribe numbers about 4,500.

CHICKASHA, a town of Oklahoma, the county-seat of Grady co. It is on

the Chicago, Rock Island, and Pacific, the Frisco Lines, and the Oklahoma Central railroads, and on the Washita river. The town has machine shops, flour mills, stock feeding pens, and other industries. It is the seat of a State college for women, and has a public library. Pop. (1910) 10,320; (1920) 10,179.

CHICKEN-POX, a contagious and infectious disease, is characterized by a specific eruption, which breaks out over the whole body, and runs a definite course in about eight or ten days. The disease appears to be the result of a specific poison which, after a period of latency or incubation, develops into one of more or less feverishness. This lasts for two or three days, when an eruption of pimples appears, at first on the body, then on the face and head, the fever subsiding as the rash appears. These pimples soon fill up with lymph, and become vesicles which in their turn, two or three days later, shrivel up and fall off in the form of crusts or scabs, seldom, however, becoming purulent or pitting as in the eruption of small-pox. Adults seldom suffer from chicken-pox.

CHICLAYO, a city of Peru, 12 miles S. E. of Lambayeque; is the center of a valuable sugar district. The United States consular agent resides in this municipality. Population about 14,000.

CHICO, a city of California, in Butte co. It is on the Southern Pacific and the Butte County railroads, and on Chico creek. It is the center of an important fruit-growing, dairying, and mining region. It has a large plant of the Diamond Match Company, flour mills, and machine shops. It is the seat of a State normal school, and has a public library and a park. Pop. (1910) 3,750; (1920) 9,839.

CHICOPEE, a city in Hampden co., Mass., on the Connecticut and Chicopee rivers, and on the Boston and Maine railroad, 3 miles N. of Springfield. It is connected with Holyoke and Springfield by electric street railway lines and contains the villages of Chicopee Falls, Willimansett, and Fairview. It is an important manufacturing city, and has fine water power, obtained from Chicopee Falls. Its manufactures include bicycles, blankets, military equipments, brass and cotton goods, machine tools, etc. It has a high school, graded public schools, public library, newspapers, several banks, etc. Pop. (1910) 25,401; (1920) 36,214.

CHIEF-JUSTICE, or **LORD CHIEF-JUSTICE**, in England, the presiding judge in the King's (or Queen's) Bench

division of the High Court of Justice, and, in the absence of the lord-chancellor, president of the High Court, and also, *ex officio*, one of the judges of the Court of Appeal. The title chief-justice is also generally given in the various British colonies to the heads of the different judicial establishments, as in Canada, Australia, etc. In Canada there is not only a chief-justice at the head of the Supreme Court of the Dominion, but also chief-justices in the separate provinces.

CHIGNECTO BAY, an inlet at the head of the Bay of Fundy, in British North America. It separates Nova Scotia from New Brunswick, is 30 miles long and 8 broad, and has an isthmus of only 14 miles in width between it and Northumberland strait, in the Gulf of St. Lawrence.

CHIHUAHUA (chē-wħā'whā), the largest State of Mexico; bounded on the N. and N. E. by New Mexico and Texas; area, 90,036 square miles; pop. about 450,000. In the E. is the *Bolson dé Mapimi*, a vast desert of sand and alkali plains; in the S. and W. the surface is mountainous, and there are numerous rivers. The State is better adapted for stock-raising than for agriculture; the fertile districts are mainly confined to the valleys and river-courses. Cotton is grown in the S. The silver mines were for centuries among the richest in Mexico, and though many are now abandoned, mining is still the chief industry. The State is traversed by the Mexican Central railway and has also several other railroad lines. The capital, Chihuahua, 225 miles S. of El Paso, rises like an oasis in the desert, among roses and orange groves. It is well built, with broad, clean streets, an imposing cathedral (1717-1789), a mint, and an aqueduct 3 miles long, and is the center of considerable trade with Texas. It is in the center of a rich mining district and has important cotton and woolen mills. Founded about 1700, it had in the 18th century 80,000 inhabitants. Pop. about 40,000.

CHILBLAIN, or **FROSTBITE**, a blain or sore on the hands or feet produced by cold, especially if the parts were previously much heated.

CHILD, FRANCIS JAMES, an American poet and educator; born in Boston, Mass., Feb. 1, 1825. He was professor of rhetoric and oratory at Harvard from 1851 till 1876, when he exchanged for the chair of English literature. His principal work, "English and Scottish Ballads," a subject on which he was the highest authority in this country, he im-

proved and enlarged for publication in 1886. Among his other works are: "Four Old Plays" (1848), and a collection of "Poems of Sorrow and Comfort" (1865). He died in Boston, Sept. 11, 1896.

CHILD, LYDIA MARIA, an American prose-writer; born in Medford, Mass., Feb. 11, 1802. Her first novel, "Hobomok," was written and published in 1821. She was an ardent abolitionist, and published the first book written on that subject, entitled "Appeal for that class of Americans called African." Among her numerous works are: "Philothea," a romance of Greece in the days of Pericles (1835); "Looking Toward Sunset" (1864); "Maria: A Romance of the Republic" (1867); and "Aspirations of the World" (1878). She died in Wayland, Mass., Oct. 20, 1880.

CHILD, RICHARD WASHBURN, an American lawyer and author; born at Worcester, Mass., in 1881. He studied at Harvard, from which he graduated in 1903, and was admitted to the bar in 1906. During the World War he was an assistant of Frank A. Vanderlip in war finance work at the United States Treasury. In 1919 he joined the editorial staff of "Collier's Weekly." He took an active part in the presidential campaign of 1920 on behalf of Senator Harding. He was a frequent contributor to magazines. Among his publications are: "Jim Hands" (1910); "The Man in the Shadow" (1911); "The Blue Wall" (1912); "Bodbank" (1916); etc.

CHILDEBERT (shéld-bär'), the name of three kings of the Merovingian dynasty, France. The first of this name was the third son of Clovis, and born about A. D. 495. On his father's death, in 511, he succeeded to the kingdom of Paris. Died in 558. Childebert II. was the son of Siegbert and Brunhild, and born about 570. He died in 596. Childebert III., surnamed the Just, son of Thierry I., King of the Franks, was born about 683, and died in 711.

CHILD LABOR. Efforts to regulate conditions under which children are employed in industrial operations have continued since the great industrial expansion in the United States, following the Civil War. Abuses in the employment of children reached the point where legislation was essential. In 1879 children of 8 to 11 years of age were employed in factories from 11 to 14 hours daily. According to the census of 1900, children under 16 formed 13.3 per cent. of all persons engaged in cotton manufacture in the United States. As a result of legislation, this per-

centage had declined in 1909 to 10.4 per cent. Laws relating to child labor in the United States usually fix a certain age limit, prohibit certain kinds of employment for children, as dangerous to health or morals, limit the number of hours a person under a certain age may be employed, prohibit night work for children, and, in a large number of cases, fix educational requirements for children under a given age. The age limit in most States is from 14 to 16 years. In California and Michigan children under 18 may not be employed in factories more than 9 hours a day. In New York children under 16 are limited to an eight-hour day. Nearly all the States prohibit the employment of children in work that is especially dangerous. Night work is prohibited in many States.

The restrictions that were gradually being placed about child labor with a view to race betterment, were sensibly relaxed during the World War, because of the great demand for labor in every department of activity among the Allied nations. With the close of the conflict, the subject came once more to the fore in economic discussion and legislation. It was carefully considered by the Commission on International Labor Legislation at the Peace Conference at Paris, which recommended: "No child should be permitted to be employed in industry or commerce before the age of 14 years, in order that every child may be assured reasonable opportunities for mental and physical education; between the ages of 14 and 18, young persons of either sex may be employed only on work which is not harmful to their physical development and on condition that the continuation of their technical or general education is assured." In a somewhat modified form, these recommendations were adopted by the Conference. At three successive international conferences held in 1919 in Washington and Montevideo, practically similar resolutions were adopted. In the United States, a new Federal Child Labor Law was passed through both Houses in 1918 and signed by President Wilson, Feb. 24, 1919. This was designed to take the place of the previous Child Labor Law which had been declared unconstitutional by the Supreme Court in 1918, because its enforcement had been sought through interstate commerce regulations. The new law used the Federal Taxation Power as the medium of enforcement, and a summary of its provisions is as follows:

"The amendment imposes a tax of 10 per cent. on the net profits from the operation of (a) any mine or quarry sit-

uated in the United States in which children under the age of 16 years have been employed or permitted to work during any portion of the taxable year; or (b) any mill, cannery, workshop, factory or manufacturing establishment situated in the United States in which children under the age of 14 years have been employed or permitted to work, or children between the ages of 14 or 16 years have been employed or permitted to work more than eight hours in any day or for more than six days in any week, or after the hour of 7 o'clock p. m. or before the hour of 6 o'clock a. m. during any portion of the taxable year. Such a tax is not to apply in case of an employer relying in good faith upon an employment certificate issued under regulations prescribed by a board composed of the Secretary of Labor, the Secretary of the Treasury and the Commissioner of Internal Revenue; nor in case of an employer who satisfies the Secretary of the Treasury that his employment of a child under the prescribed ages was due to an honest mistake of fact as to the age of the said child."

The law went into effect April 25, 1919, but scarcely a week later, on May 2, was declared unconstitutional by Federal Judge Boyd of North Carolina, who based his decision on his conviction that "Congress was trying to do by indirection what it had no constitutional power to do directly." The case was sent back to the Supreme Court of the United States for final adjudication.

Whatever the final fate of the national law, the States were still left free to enact such legislation as they might see fit in relation to child labor. During the year 1919, thirty States strengthened legislation of this character and only two, Connecticut and Vermont, made the existing law less stringent. Progress has also been made in foreign lands, notably in England, Poland, Germany, Mexico, and Russia. In connection with the latter, an official statement was made, that when commercial relations should be resumed with other countries, no goods would be allowed to enter Russia that had been manufactured by child labor.

CHILD PSYCHOLOGY. See PSYCHOLOGY.

CHILDREN. SOCIETIES FOR THE PREVENTION OF CRUELTY TO, organizations that had their origin in New York City, and have since been adopted in most American and many European cities. Experience proved that defenseless children were not infrequently grossly maltreated by parents or other

legal protectors, and that therefore special legislation was necessary to secure their proper treatment. To ameliorate the condition of children has therefore entered largely into the scope of modern legislation. The principal purpose of the Societies for the Prevention of Cruelty to Children is to shield them from abuse and to care for them, at least temporarily until their cases have been disposed by a court.

CHILDREN'S BUREAU, a bureau of the United States Government, established under the supervision of the Department of Labor in 1912. It is authorized to investigate and report on matters pertaining to child life. These include the birth rate, infant mortality, juvenile courts, accidents and diseases of children, etc. The chief of the bureau in 1921 was Miss Julia C. Lathrop.

CHILDREN'S COURTS. See JUVENILE COURTS.

CHILDREN'S CRUSADE, THE, a singular movement in 1212, preached in France by Stephen, a peasant boy, and in Germany the same year by Nicholas, also a peasant boy. Some 90,000 children left their mothers and schoolmasters in the spring "to rescue the Holy Land from the infidels," and ships were placed at their disposal. The French contingent embarked at Marseilles in August; part perished the same month by shipwreck on the island of San Pietro, and the rest were sold into slavery to Mohammedans. The German contingent reached Genoa in August, and was utterly dispersed by various disasters before the next spring.

CHILDS, GEORGE WILLIAM, an American philanthropist and publisher; born in Baltimore, Md., May 22, 1829. He published the Philadelphia "Public Ledger," 1864-1894. He gave a Shakespeare memorial fountain to Stratford-on-Avon, a memorial window in Westminster Abbey to Cowper and Herbert, and assisted in establishing a home for printers at Colorado Springs. He published "Recollections of General Grant" (1885), and "Personal Recollections" (1889). He died in Philadelphia, Feb. 3, 1894.

CHILE, a republic of South America, bounded on the N. by Peru, E. by Bolivia and the Argentine Republic, S. and W. by the Pacific Ocean; area, 290,829 square miles. In 1918 the population was 3,945,538. Some of the leading towns had the following population in 1916: Santiago, 397,550; Valparaiso, 201,507; Concepcion, 68,902; Iquique, 45,502; Talque, 41,618; Chillan, 38,543; Anto-

fagasta, 56,295. Santiago, the capital, is beautifully laid out and adorned with cathedrals, parks, and imposing public buildings. It has two universities. Valparaiso is the chief seaport and is a handsome and thriving city.

Topography.—The Andes extend in two parallel lines throughout nearly the entire length of the country. Between these two ranges of the "Cordillera" there is a central valley or tableland which attains its greatest breadth between 33° and 40° S. The streams in the N. are of little importance, being mostly shallow brooks; in the S. they are larger and more numerous, though most are navigable for only a few miles. The principal rivers are the Maipu, which waters the valley of Santiago; the Maule; the Biobio, the largest river in the country; the Cautin, or Rio Imperial; the Bueno, and the Callecalle, or Rio de Valdivia (100 miles), the most important of all, because of the sheltered harbor at its mouth. In the S. are also many deep lakes, such as Llanquihue (30 miles long by 22 broad) and Ranco (32 by 18 miles). The most important islands are those constituting the province of Chiloe; Juan Fernandez also belongs to Chile. Owing to its great extension from N. to S., Chile comprises regions of very different nature and climate. The N. provinces are arid, rainless districts, where the principal industry is mining and extraction of saltpeter. The middle and S. provinces are agricultural and viticultural, and have also valuable coal fields. The Patagonian region is densely wooded and sparsely inhabited by a few Indians. The Andes are almost everywhere visible, covered with perpetual snow. The highest peak is Aconcagua, 22,867 feet. The average height of the range is 8,000 feet. There are many volcanic peaks, mostly extinct. Among these may be mentioned Tupungato, Descabezado, Chillan, Osorno, and Villa Rica. Chile is subject to frequent shocks of earthquakes, and occasionally to destructive floods. The most notable of seismic movements recorded was in 1822, when the coast near Valparaiso was thrown up permanently between 3 and 4 feet; this elevation extended over 100,000 square miles. In 1835 Concepcion and Talcahuano were destroyed by a fearful earthquake which produced disaster all over the southern provinces.

Climate and Productions.—The climate of Chile is temperate. In the N. it is moderately hot and rainless, but banks of clouds always hang overhead, and heavy dew falls at night. In the S. it is dry for about eight months of the year, and rainy the other four. The tempera-

ture is remarkably even and pleasant, and always cool at night. The S. wind blows fiercely during many days of summer, dry and cold; the N. wind brings heat, tempest, and rain; other winds are unknown. Central Chile, between lat. 32° and 36°, is fertile. In southern Chile generally the land is poor, and on account of excessive rain of hardly any value for agriculture, which, indeed, is carried on in a very primitive fashion, but the soil of the valleys, where large herds of cattle graze, is very fertile. Vines, also, grow well on the Maipu and Mapocho plains and on the hillsides, and the wines of the country are superseding in Chile the French red wines. Wheat and vineyard products are the chief staples, but maize, hemp, barley, beans, and various root edibles are extensively cultivated. There are 95,000,000 acres of arable land and 39,362,100 acres of forest land. The farms under cultivation were 91,309 in 1916. Large irrigation canals now in process of construction will have a marked effect on agricultural production. The principal source of Chilean prosperity is the nitrate industry. Vast deposits of sodium nitrate exist in the desert of Atacama. The zone has an area of 200,000 square kilometers, of which only about 3 per cent. has been surveyed and the contents estimated. But in this fraction of the entire area 290,300,000 tons exist, of which about 50,000,000 tons have been extracted. The exports of nitrate in 1917 were 60,800,000 quintals (a quintal being 104.4 pounds).

According to the industrial census taken in 1916 there were 21,306 industrial establishments in the republic, whose completed product was valued at 1,407,137,140 gold pesos (gold peso = 36½ cents).

Commerce.—The imports in 1918 were valued at £42,705,554 and the exports at £57,271,688. The chief imports were mineral products, chemical products, metals, and machinery. The chief exports were mineral products, live stock, foods, and textiles.

Finances.—The monetary unit is the peso, which has a value of 36.5 cents in United States money. The external debt of Chile, Jan. 1, 1918, was 31,035,820 pesos; the internal debt amounted to 42,708,193 pesos, currency. The expenditures in 1919 were £16,621,210 and the revenues £18,743,250. The currency in circulation in 1917 was 117,980,119 pesos.

Transportation and Communication.—There are 4,521 miles of railway in operation, and other lines under construction will increase the total to 5,684 miles. Of this amount 3,541 miles is govern-

ment-owned. Forty-four thousand miles of telephone wire are in operation and 22,500 miles of telegraph wire. There are 21,000 miles of public roads, 660 miles of navigable lakes, and 528 miles of navigable rivers. The wireless telegraph system includes stations at Coquimbo, Arica, Antofagasta, Talcahuano, Valparaiso, Valdivia, Punta Arenas, Puerto Montt, and the Juan Fernandez Islands. There are 1,114 post offices that annually handle 65,000,000 pieces of mail matter.

Education.—Education in Chile is in a backward state and fully 75 per cent. of the population are illiterate. The schools, which are confined chiefly to the towns, are free, but attendance is not compulsory. The total appropriation for school purposes in 1915 was less than \$3,000,000. In 1913 there were 3,151 public schools with an attendance of 318,000; 16 public normal schools with a registry of 2,650 pupils; 86 public secondary schools with 25,500 students; 11 public commercial schools with an attendance of 3,660. Besides these there are a number of private schools in all the grades mentioned. Higher education is provided by the University of Chile, which has 1,300 students, and the National Institute, with an enrollment of 1,200. There are also commercial and technical schools, lyceums, schools of fine arts and agriculture, and musical conservatories. Much of the education of the upper and middle classes is gained in private schools. The country contains 41 public libraries, with 240,000 volumes. In the large cities there are museums of natural history, and of the fine arts. There are special schools for the army and navy.

Defense.—Military service is compulsory on all males between the ages of 18 and 45. The recruits receive one year's training, then have a first reserve service of nine years, and after that remain in the second reserve until they are 45. The average strength of the army is about 18,000, and of the navy 6,000. There is an air force, equipped with 14 seaplanes and 50 airplanes. This came into being at the close of the World War, the planes being purchased from Great Britain. The navy has three battleships of about 7,500 tons each, 11 destroyers, 5 torpedo boats and 2 training ships, besides colliers and auxiliary vessels.

Government.—The government is that of a republic, the chief magistrate being a president, elected for five years, who is thereafter ineligible to immediate re-election. The president has a cabinet consisting of six members and a Council of State of 11, six of whom are named by Congress. Legislation is conducted by a

Chamber of Deputies, chosen by popular vote, one for each 30,000 or major fraction thereof, and who serve three years, renewable by thirds every three years; and a Senate, members of which are chosen for nine years, one for each three deputies, by direct popular vote. For administrative purposes Chile is divided into 24 provinces and territories, and the provinces in turn into departments, sub-delegations, and districts. Each province is governed by an intendant (nominated by the president), who also acts as governor of the department in which the capital of the province is situated. The departments are governed by governors, the minor divisions by sub-delegates and inspectors. The established religion of Chile is Roman Catholic, but the constitution guarantees freedom of worship.

History.—The name of Chile is supposed to be derived from an ancient Peruvian word signifying "snow." The N. portion, as far as the river Maule, formed part of the dominions of the Incas of Peru, and the S. was held by the valiant Araucanians. The first European to land in Chile was the Portuguese discoverer Magellan, at Chiloe, in 1520. After the conquest of Peru by Pizarro, an expedition was made to Chile from that country overland, under the leadership of Diego de Almagro in 1535. This expedition penetrated as far as the Rio Claro, but returned unsuccessful. Another was sent under command of Pedro Valdivia in 1540, which succeeded in annexing the territory as far as the river Maipu. Santiago, the capital, was founded by Valdivia in 1542. During the colonial period the governors of Chile were appointed by the King of Spain, but were subordinate to the viceroys of Peru. In 1810 a revolt against the Spanish power broke out, in which Don Bernardo O'Higgins, son of one of the last viceroys of Peru, but a native of Chile, played a conspicuous part, and finally became the first dictator of the new republic. The conflict between the Spanish troops and the Republican army continued until 1826, when peace was definitely settled and Chile left to govern itself. The first constitutional president was General Blanco Encalada. The government was unsettled till 1830. In 1833 the present constitution was adopted. Revolutions broke out in 1851 and 1859, but since then there has been no serious attempt to overturn the government by force of arms. In 1864 Chile gave Peru very valuable support in her war with Spain. Valparaiso was bombarded by the Spaniards in 1866. In 1879 Chile declared war against Bolivia on account of an alleged violation of

treaty rights, and immediately after against Peru, with which Bolivia was allied. For a time the Peruvian fleet kept the Chileans in check, but in August, 1879, the Peruvian ironclad "Huascar" was captured by the Chilean men-of-war "Cochrane" and "Blanco Encalada," both armor-plated. After this event the success of the Chileans was uninterrupted. Peruvian towns were bombarded, and their other warships captured. Finally Lima was taken by storm on June 21, 1881. The Chileans occupied Lima and Callao until Oct. 30, 1885, when a treaty of peace was signed between Chile and Peru. Up to 1900 no treaty of peace had been signed by Chile and Bolivia; a treaty of indefinite truce having been agreed to in 1884. In 1885 Jose Manuel Balmaceda, representing the Liberal party, was elected president. He undertook sweeping reforms and thereby aroused the hostility of the Conservative party, who accused him of plotting to name his successor. The hostile factions organized a rebellion, and formed a junta, or provisional government, under whose management the forces of Balmaceda were repeatedly defeated. He was finally shut up in Santiago, seeking refuge in the house of the Argentine minister, where he committed suicide, Sept. 19, 1891. During these hostilities the United States minister, Patrick Egan, aroused the hostility of the revolutionists by appearing to side with Balmaceda and to misrepresent the strength of the revolution in his dispatches. He afforded an asylum also to fugitives of Balmaceda's army. In a riot in Valparaiso some United States marines were set upon and wounded. Reparation was demanded and refused, and war between Chile and the United States seemed imminent. Two war vessels were sent to Chile to enforce the demands of the United States, when the new president, Montt, tendered an apology, and the Chilean government provided compensation for the wounded men, which ended the incident peacefully.

A dispute between Chile and Argentina at the beginning of the century that threatened a resort to arms concerned boundaries. It was happily adjusted, however, through the mediation of the United States ambassador in one instance and through the arbitration of the King of England in another. The success of this arrangement was the moving cause of a convention between the two governments, concluded May 28, 1902, by which they agreed to settle all questions in a friendly manner and renounced the acquisition of war vessels that they then had under construction, as well as agreeing to reduce the strength of their re-

spective fleets until they reached a prudent equilibrium. In May, 1905, an analogous treaty that this time included Brazil was signed at Buenos Aires. From the initials of the three contracting governments this was known as the A B C treaty. In 1909 diplomatic relations with Peru were broken by Chile, but without war resulting. The long-standing dispute between the two nations regarding Tacna and Arica flared up again in 1919 and for a time war was threatened, but up to 1920 hostilities had been averted.

The course of Chile during the World War was one of strict neutrality. In this she differed from most of the South American nations, which had ranged themselves on the side of the Allies either by a direct declaration of war against Germany or by the severance of diplomatic relations with the latter power. The prevailing opinion in Chile was that Germany would win or that the war would practically result in a draw. The destruction of the German cruiser "Dresden" by a British fleet in the territorial waters of Chile in 1916 brought forth a protest from the Chilean government, and Great Britain tendered an apology, which was accepted. The 109th anniversary of the establishment of the republic was celebrated Sept. 18, 1919. The president in 1920 was Juan Luis Sanfuentes, a Liberal Democrat, who was inaugurated Dec. 23, 1915. His term of office is for five years and he cannot be a candidate for re-election for a consecutive period. On July 14, 1920, Chile called to the colors the military classes of 1915 to 1919 inclusive, in view of the possible emergencies arising from the Bolivian revolution.

CHI-LI, CHIH-LI, or PE-CHI-LI, a maritime province of China. It has an area of 115,800 square miles and is bounded N. by Mongolia, E. by the gulf called Pe-Chi-Li, and by the province of Shang-Tung, and W. by the province of Shan-Hsi. Chi-Li is in many respects the most important of the Chinese provinces, containing as it does the imperial capital, Peking, and the treaty port of Tien-Tsin. The Great Wall runs across the whole of the N. part of Chi-Li, while on the coast are the forts of Taku, and the nearest approach to a naval station belonging to the Chinese government. The province is mountainous and traversed by important rivers, notably the Pei-Ho, the Lan, the Ho-Kien, and the Hu-to. The Yu-Ho is especially important because of the canal system developed throughout its course in Chi-Li. There are numerous towns of the first, or Fu class, second, or Chou class, and third, or Hien class. These towns are

surrounded by walls. There are Christian missionaries of many denominations throughout the province. The population is estimated at 25,000,000, including a large Manchu element. They are engaged in commerce, and before the World War Chi-Li had much communication with Russia by way of Siberia. The climate is at times severe, the Pei-Ho being generally frozen over from December to March. The Belgians, the Italians, and the English have important railway concessions in the province. There is a good system of telegraph lines. The exports are principally bristles, feathers, wool, skins, etc. Chi-Li has valuable coal mines at Kai-Ping and other mineral resources. The soil is fertile. The provincial capital is Pao-Ting-Fu, 80 miles from Peking.

CHILKAT INLET, western arm of Lynn Canal, an inlet in Alaska, in about 50° 7' N. lat.

CHILKOOT PASS, a pass over the mountains in the northern part of Alaska, traversed by thousands of gold-seekers in the Klondike gold fields' excitement in 1897-1898. By way of the Chilkoot Pass is the most direct route to Dawson City, the principal starting point to the Klondike region. Since 1899 it has been superseded by the railway from Skagway over White Pass. The old trail went from Dyea on the western side of the inlet, and was the one formerly used by the Indians. It lies to the west of the railroad and ends at Lake Lindeman, an extension of Lake Bennett. The distance from Dyea was 28½ miles and the trip a very rough one, with one stretch hazardous and fatiguing in the extreme.

CHILLICOTHE, a city and county-seat of Livingston co., Mo.; on the Wabash, Chicago, Milwaukee and St. Paul, and the Hannibal and St. Joseph railways, 70 miles E. of St. Joseph. It is a farming trade center and has several manufacturing industries. It is the seat of the Chillicothe Normal School, State Hospital, State Industrial School for Girls, and St. Mary's Hospital, and is near the noted health resort, Laurel Mineral Springs. It has several daily and weekly newspapers, electric lights and street railroads, two National banks, etc. Pop. (1910) 6,265; (1920) 6,772.

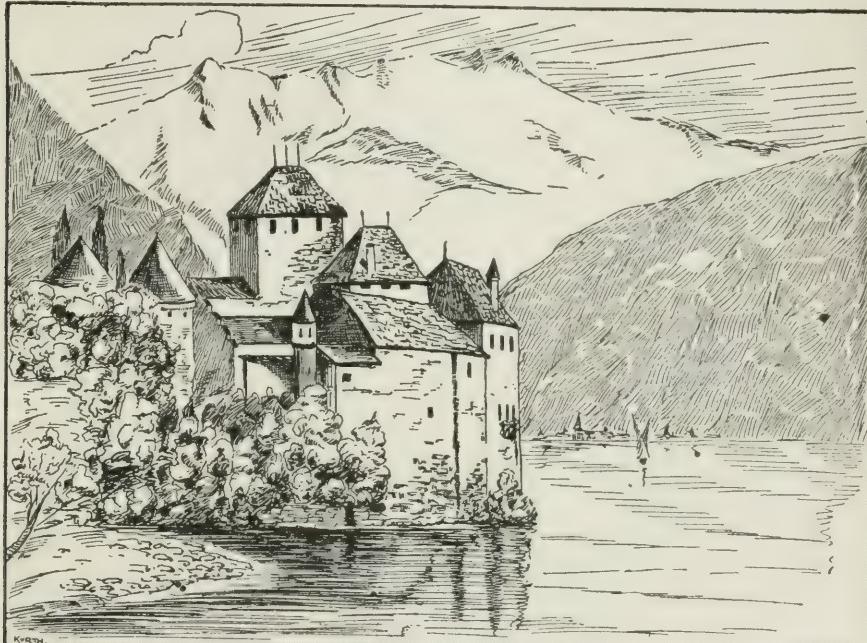
CHILLICOTHE, a city and county-seat of Ross co., O.; on the Scioto river, Point Creek, the Norfolk and Western, the Cincinnati, Hamilton, and Dayton, and the Baltimore and Ohio Southwestern railroads, and the Ohio and Erie canal, 50 miles S. of Columbus. It is in an agricultural and coal mining re-

gion, and has flour and paper mills, foundries and machine shops, manufacturers of furniture, shoes, wagons, etc., daily and weekly newspapers, and four National banks. Pop. (1910) 14,508; (1920) 15,831.

CHILLON, CASTLE OF, a fortress of Switzerland, in the canton Vaud, 6 miles S. E. of Vevay. It stands on an isolated rock at the E. end of the Lake

which he immediately vacates for the benefit of others.

CHIMBORAZO, a conical peak of the Andes, in Ecuador, 20,517 feet above the sea, but only about 11,000 above the level of the valley of Quito, to the N. The "silver bell" of perpetual snow and glacier was long erroneously regarded as the loftiest mountain not only in America but in the whole world. In 1745 La



CASTLE OF CHILLON

of Geneva. It was built in 1238, by Amadeus IV. of Savoy, and was long used as a State prison. In 1859 it was occupied as an arsenal. Near this castle Rousseau fixed the catastrophe of his "Heloise," and in it Bonnivard, Byron's "Prisoner of Chillon," was confined for several years.

CHILTERN HILLS, a range of flint and chalk hills in England, extending through Oxford, Hertford, and Buckingham shires; loftiest summit 905 feet. These hills were anciently covered with forests, and were infested by numerous bands of robbers. The steward of the Cnuntern Hundreds originally was an officer of the crown, appointed to protect the people of Bucks from the robbers of the Chiltern hills. This office is now a sinecure, but as a member of Parliament can only resign his seat by accepting office, he accepts this sinecure,

Condamine ascended to 16,730 feet; no complete ascent had been made, till Whymper in 1880 twice reached the summit. The peak gives name to the province of Chimborazo, to the S. with an area of 5,523 square miles, and a pop. of about 125,000.

CHIMERE (shī-mēr'), the upper robe to which the lawn sleeves of a bishop are attached.

CHIMPANZEE, a name formerly applied to more than one of the larger man-shaped apes, but properly belonging to the *Troglodytes niger*, a native of the equatorial parts of western Africa. Its associate in the genus *troglodytes* is the gorilla. The face is nearly hairless, the skin a dirty yellow ochre, teeth beautifully white, hair black and long. In the chimpanzee the arms are longer than the hind limbs, and when the animal is erect

they reach below the knee. They are not, however, proportionately so long as in the gibbons and orangs. Its height is about five feet. The look is very much that of a very old child. In habits it is

of Central Asia. In form it approaches to a square, and it covers a surface, including dependencies, of nearly 4,000,000 square miles. It is inhabited by at least 325,000,000 of the human race, living



CHIMPANZEE

gentle and amiable, and easily makes friends.

CHINA, or the **CHINESE REPUBLIC**, a vast territory in Asia, comprehending seven great divisions, viz.: Manchuria, Mongolia, Hsinchiang, Fengtien, Kirin, Heilungchiang, Tibet, China proper, or the Eighteen Provinces (Shih - pa - Shang), formerly including the island of Formosa. As a consequence of the Chino-Japanese War, Formosa was ceded to Japan by treaty. China proper occupies the E. slope of the tablelands

under the same government, ruled by the same laws, speaking the same language, studying the same literature, possessing a greater homogeneity, a history extending over a longer period, and a more enduring national existence than any other people, whether of ancient or modern times. When we consider its high antiquity, its peculiar civilization, its elaborate administrative machinery, its wondrous language, its philosophy and classic literature, its manufacturing industry and natural productions, China is perhaps the most remarkable country in





CHINESE REPUBLIC
AND
KOREA
(CHOSEN)

SCALE IN STATUTE MILES
0 100 200 300 400 500 600 700

SCALE IN KILOMETERS
0 200 400 600 800 1000

Important towns are shown in heavy face type.
Capital of Country the Capital of Province or
Territory Ports Railroads
S. American Cities

the world. Following are the areas and population of the divisions in 1919:

	Sq. M.	Pop.
China (proper)	1,532,420	302,110,000
Manchuria	363,610	2,000,000
Mongolia	1,367,600	1,800,000
Tibet	463,200	2,000,000
Hsinchiang	550,340	2,000,000

Other dependencies are Fengtien, Kirin, and Heilung-chiang. These have a population of about 13,000,000.

Principal Cities.—These are Peking (cap.), with 1,000,000 or more population; Canton, Tien-Tsin, Hankow, Nan-king, Shanghai, Ning-po, Foochow, Amoy, Swatow, and 30 or 40 more with a population from 800,000 to 1,500,000. No census figures based upon official returns are obtainable, but estimates in 1900 give the following as the population of the leading ports of entry:

Canton	2,500,000
Tien-Tsin	950,000
Hang-Chau	700,000
Hankau	800,000
Fu-Chau	650,000
Su-Chau	500,000

These are all treaty ports, accessible and open to commerce.

Physical Features.—A world-famous structure is the Great Wall, called Wan-li-chang-Cheng (myriad-mile-wall) by the Chinese, which was built by the first emperor of the Tsin dynasty about 220 B. C., as a protection against the Tartar tribes. It traverses the N. boundary of China, extending from $3\frac{1}{2}$ ° E. to 15° W. of Peking and is carried over the highest hills, through the deepest valleys, across rivers and every other natural obstacle. The length of this great barrier is, according to McCulloch, 1,250 miles. The magnificent river-system of China is represented by the twin streams, the Hoang-ho, or Yellow river, and the Yang-tze-kiang, which, springing from the water-shed, the mountains of Tibet, are widely separated in their mid-course, but enter the sea within 2° of each other. The former is a "mighty, impracticable, furious stream" for the most part, and little adapted for navigation. But the river most beloved by the Chinese is the Yang-tze-kiang, or "son of the ocean," more correctly translated "the son that spreads," which name is only applied to it by the natives below the beginning of the delta; for above that it is called simply Ta-kiang, or Great river. The basin drained by it is estimated at 750,000 square miles. Of the other rivers that water the country, the Peiho, in the N. and the Choo-kiang in the S. are the most noteworthy. The principal lakes of China are the Tung-ting-hu, the

Poyang-hu, the Hung-tseu-hu, in Kiang-su; the Tsau-hu, between Nganking-fu and Nanking; and the Tai-hu. There are four great mountain ranges and six or eight of lesser elevation; the Himalayas, Tian-Shan, Kuen-Lun and Altai. The Kin-gan in the N., and the Peh-ling in north China, and Nan-king in south China, are prolongations of the Altai and Himalayas. The Grand Canal has very greatly facilitated the internal navigation of the country. Until lately the great annual grain-fleet, with its 430,000 tons of rice for the use of the capital, passed from the S. to the neighborhood of Peking by this great waterway, thus avoiding the storms and pirates of the coast. It connects Tien-Tsin in Chi-li with Hang-chow in Che-kiang, though the canal proper begins in Shantung, and its total length is about 650 miles.

Climate.—In a country of such vast area, extending from 18° to 40° N. lat., the climate must vary greatly, and accordingly we meet the most violent extremes. The heat of summer is greater than that at Cairo, and the cold of winter more severe than that of Sweden.

Productions.—Most famous among the minerals of China is jade, or yu-stone, obtained chiefly in Yun-nan. Coal, lime, and porcelain clays are abundant. Precious stones are said to be met with in some districts. In Yun-nan gold is washed from the sands of the rivers, and in the same province silver mines are worked; here, too, is obtained the celebrated pe-tung, or white copper. All the commoner metals are likewise found in China. Near the city of Ning-po are extensive stone-quarries. The tea-plant (*Thea viridis* and *Thea bohea*) is the most important vegetable production of China. The tallow-tree (*Stillingia sebifera*), the *Dryandra cordata*, or vanish-tree, the camphor-tree (*Laurus Camphora*), the China pine (*Pinus Sinensis*), the China banyan (*Ficus nitida*), the funeral cypress, and the mulberry are among the most important trees of China. The cocoanut and other palms flourish on the S. coast. Of the bamboo there are 63 principal varieties; and it is said that the bamboos of China are more valuable than her mines and, next to rice and silk, yield the greatest revenue. The various uses to which they are applied is truly astonishing. The fruits of both the tropical and temperate zones, apples, grapes, pomegranates, mangoes, pineapples, three species of orange, the lichi, etc., are found in the country; and camellias, azaleas, and gardenias are natives of the "Flower Land."

Finances and Commerce.—The total imports of China in 1918 amounted to £145,658,383, and the exports £127,554,295. Japan ranks first in foreign trade, having over 50 per cent.; the British Empire has over 23 per cent., and the United States about 4.5 per cent. The chief articles of import are cotton goods, metals, rice, cigarettes, coal, and fish. The chief articles of export are silk, raw and manufactured; raw cotton; bean cake; bean oil; hides; tea; and tin. In addition to her overseas trade, China has an extensive coast and river trade, in which under special regulations, vessels under foreign flags are allowed to participate. In 1918 1,601 vessels were registered, of which 354 were foreign and 1,247 Chinese.

The present foreign debt of China is largely a matter of conjecture, as many secret loans have been negotiated by more or less responsible administrations. The Tuan-Chi-Jiu administration has been the greatest offender in this respect, as it borrowed recklessly from Japanese sources in order to repress the southern rebellion. As far as is known, the foreign debt secured by government revenue outstanding on Dec. 1, 1916, amounted to about \$860,000,000. The revenue for 1916 was \$472,838,584, and the expenditures were the same.

Manufactures.—The manufactures of the Chinese are silk, cotton, linen, and pottery, for which latter they are especially celebrated. The finest porcelain is made in the province of Kiang-si. The Chinese invented printing in the beginning of the 10th century, and in 932 A.D. a printed imperial edition of the sacred books was published. The skill of the Chinese in handicraft is astonishing. Of the grand modern discoveries in the physical sciences the Chinese are profoundly ignorant, and the study of nature is altogether neglected.

Railways.—In 1919 more than 6,000 miles of railway had been completed and opened to traffic in China. These figures include the province of Manchuria. 2,273 miles were under construction in 1917-1918. Much greater mileage had been planned, but the construction was held up during the World War and has been hindered since then by the civil war that has spread over half the area of the Republic. The railroads now in operation have already had a marked effect upon mining and industrial development, and with the enormous population and resources of the country are assured of becoming profitable enterprises. What is needed is foreign capital, and this was arranged for at Paris on May 12, 1919, in a conference by

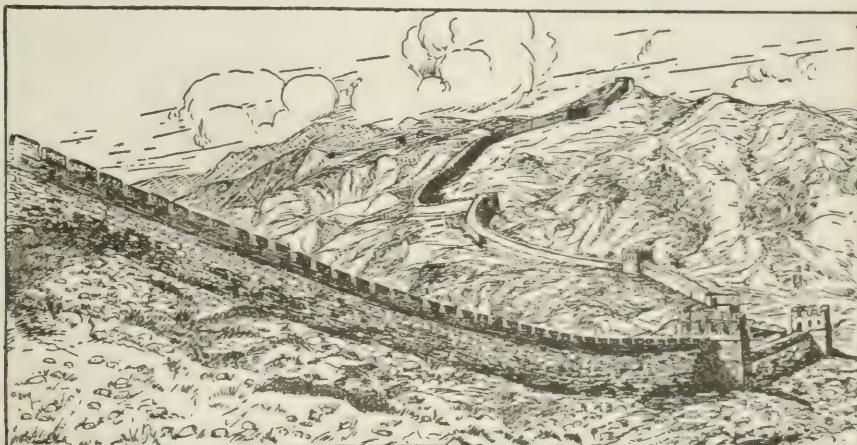
American, French, British, and Japanese bankers. These banking groups have combined for the making of loans to China, the payment of the interest and capital of which shall be a first lien upon the resources of the nation.

Religion.—Three forms of belief, the Confucian, the Buddhist, and the Taoist, may be considered the National religions, as they are believed in, more or less, by the great mass of the people. Of these the Confucian and the Taoist are indigenous, but Buddhism was introduced from India. Confucianism is the basis of the social life and political system of the Chinese. It has been professed by all their greatest men, and is still the sole belief of the educated classes. It is, however, less a religion than a philosophy and does not pretend to treat of spiritual things; hence room was left for other creeds to supply its deficiencies in this respect. Temples belonging to the three religions are very numerous. Those dedicated to Confucius are funeral in character. The Buddhist temples are crowded with images, and Buddha is represented expounding his doctrine to attentive listeners. The many-storied tower takes the place of the bell-shaped pagoda or relic-shrine of other Buddhist countries.

Education.—The educational system is divided into secondary and primary schools, the former being directed under the central government and the latter under the provincial governments. Universities, technical colleges, and higher normal schools are directed under the board of education of the central government; and middle schools, lower normal schools, and primary schools are under the control of the provincial governments. When the educational system is finally perfected, there will be 4 universities, one each in the N., center, W. and S. Capitals of provinces will have technical colleges of law, industry, and medicine, and higher normal schools. Lack of funds has prevented carrying out a complete system of education. The historic system of examinations was abolished by a decree of Sept. 3, 1905. There are over 5,000,000 pupils undergoing instruction in the schools of the Republic. The United States returned to China the surplus of the indemnity of 1900 awarded on account of the Boxer trouble, amounting to about \$10,000,000 on condition that this sum should be spent in preparing and sending students to the United States to receive their education. More than 300 students, including a few women, have been sent under these conditions. There are several universities for higher education. These include the

Peking Government University, established in 1898 and reorganized in 1917. There are at Tien-Tsin a Chinese university, a preparatory department, an Anglo-Chinese college, an industrial school, a general medical college, and other educational institutions. There is also a Union Medical College in Peking, and the Rockefeller Foundation has granted

October, 1907, an additional decree was issued ordering the formation of 36 divisions in the various provinces of the Empire for 1912. Recruiting for this army was on the principle of modified conscription. The terms of service were 3 years with the colors, 3 in the first reserve, and 4 in the 2d reserve, or a total of 10 years. The modified form



THE GREAT WALL OF CHINA

large sums to the Shantung Christian University at Tsinganfu, the Hunan-Yale Medical College at Changsha, and to the Harvard Medical School at Shanghai.

Government.—The Republic of China is composed of a president, a vice-president, and a bi-cameral legislature, consisting of a senate of 264 members and a house of representatives of 596 members. The central government has, however, little real power. The provincial governments are carried on with little regard to the central power at Peking. An attempt was made in 1913 and in succeeding years to bring the whole provincial and local administration under control and make it responsible directly to the central government. The breaking out of civil war between the north and the south resulted in the loosening of all central power. In 1920 the military governments were practically supreme and were almost uncontrolled in their respective spheres. The president for 1920 was Hsu-Shih-shang, elected president Aug. 10, 1918, and inaugurated Oct. 10, 1918. There is a premier nominated by the president and a cabinet of 9 members, nominated by the premier. All appointments require the sanction of both houses of parliament.

Army.—The creation of an army on modern lines was undertaken on January, 1905, by an imperial decree, and in

of conscription came into effect on Jan. 1, 1915. The 36 divisions were to comprise about 10,000 men each. This plan was partially carried out, but the number of men in the army never exceeded about 180,000. All military forces are theoretically under the control of the ministry of war and are paid by the central government. The provincial governors have control of the police and of the provincial militia. In late years the military governors have paid little attention to the provisions of the military law but have recruited armies as they needed them. It was estimated that in 1919 the total Chinese military forces numbered 1,200,000.

Navy.—The navy is small. It comprises a cruiser of 4,300 tons, 3 cruisers of 3,000 tons, 4 modern gunboats, 16 smaller river and other gunboats, and 3 modern and about 20 old torpedo boats. There are no naval bases of any importance.

People and Customs.—Ethnologically, the Chinese belong to that variety of the human species distinguished by a Mongolian conformation of the head and face, and monosyllabic language. A tawny or parchment-colored skin, black hair, lank and coarse, a thin beard, oblique eyes, and high cheek-bones are the principal characteristics of the race. The average height of the Chinaman is about

equal to that of the European, though his muscular power is not so great; the women are disproportionately small, and have a broad upper face, low nose, and linear eyes. The Chinese are, as a race, unwarlike, fond of peace and domestic order, capable of a high degree of organization and local self-government, sober, industrious, practical, unimaginative, literary, and deeply imbued with the mercantile spirit. The worship of ancestors is a prominent feature in their social life, and is dictated by that principle of filial piety which forms the basis of Chinese society. The rich have in their houses a chamber, a kind of domestic sanctuary, dedicated to their forefathers. Tablets, representing the deceased persons, and inscribed with their names, are here carefully preserved; and at stated seasons prostrations and ceremonials are performed before them according to the "Book of Rites." In China, marriage is universal and within the reach of all; but there is a strict separation of the sexes, and betrothal is undertaken by the parents or by professional match-makers.

Language and Literature.—The Chinese language belongs to those Asiatic languages commonly called monosyllabic, because each word is uttered by a single movement of the organs of speech, and expresses in itself a complete idea or thing. All Chinese words in the Peking tongue end either in a vowel, a diphthong (in which, however, each vowel sound is distinctly pronounced, making the word often to appear of more than one syllable), or a nasal. Of such simple words or roots there are about 450. But the accent of many of these words may be varied by the speaker in four or five different ways, so as to produce a corresponding variety in their meaning, by which means the number of simple words or roots amounts to about 1,200. The relations of words are ascertained by their position in a sentence. Hence Chinese grammar is solely syntax. In Chinese the written character, generally speaking, does not indicate the sound of the word, but gives a hieroglyphic or pictorial representation of the idea or thing to be expressed. Hence, there are required as many of these characters or symbols as there are ideas to be represented. Since many words similar in sound are different in signification, while in writing each idea has its peculiar symbol, the number of words represented by writing, without reckoning those peculiar to certain dialects, is perhaps 10 times greater than those distinguished by the ear. The number, in fact, is reckoned at 50,000. In writing

and printing the characters are arranged in perpendicular columns, which follow one another from right to left. In its origin Chinese writing is hieroglyphic or picture-writing, with the addition of a limited number of symbolical and conventional signs; the larger number of Chinese characters are formed by the combination of such hieroglyphs and signs. But as one such character by itself seldom determines the sound, an additional word is conjoined for the purpose; so that the great mass of Chinese written words consist of an ideographic and a phonetic element. Native grammarians divide their characters into six classes. The Chinese literature, from a geographical, ethnographical, and historical point of view, is unquestionably the most comprehensive and important of the whole of Asia. The printed catalogue of the Emperor Kien-lung's library is composed of 122 volumes; and a selection of the Chinese classics, with commentaries and scholia, which was begun by the order of the same emperor, is said to comprise 180,000 volumes, of which, in the year 1818, 78,731 volumes had already appeared. In the five canonical or classical books called "King" are contained the oldest monuments of Chinese poetry, history, philosophy, and jurisprudence, some portions of which belong, perhaps, to the most ancient writing of the human race. Confucius, in the 6th century B. C., collected them from various sources, and in this collection they have been pretty faithfully handed down. Amid all their scientific labors the Chinese have not neglected the art of poetry, in which they possess voluminous collections that have yet to be made known to Europe. In lyrical poetry the most distinguished names are Li-tai-pe and Tu-Fu, both of whom flourished at the beginning of the 8th century A. D. The romantic poetry of the Chinese, though void of poetic beauty, is valuable for the insight it gives into their domestic life.

History.—The legendary history of China would make it the oldest of nations. There is good reason to believe that it has an authentic history exceeding 4,200 years. The exact age when Fo-Hi, the benefactor of his country, and the founder of the silk industry, flourished cannot be told, but it was before 2375 B. C. The name of the country among all the W. nations has been always associated with silk. The Chinese of that early time were astronomers; they recorded phenomena which occurred 2375 B. C., and their record proved correct. The Emperor Yu (1991 B. C.) rendered the Great Plain habitable by run-

ning the Hoang-ho into a new channel. Confucius lived and taught 571-544 B. C. Shi Hoang-Ti (246-210 B. C.) is the greatest of their heroes; he expelled the Mongols, built the Great Wall, and burned most of the National literature. He was the founder of the Tsin dynasty. Buddhism was introduced A. D. 65. The next 1,200 years were prolific of wars between the Chinese and the Mongols, the latter conquering in 1279 and holding the country till 1368. Then the Ming (native) dynasty regained power, and held it till 1644. The Manchus succeeded, and have held the power till now.

In the 19th century they had wars with Great Britain and France (1857-1860); the great Tai-ping rebellion, lasting 14 years; a Mohammedan rebellion in Yunnan lasting 23 years, and another in eastern Turkestan lasting 11 years; war with France (1884-1885), and war with Japan (1894-1895). Russia's occupation of Port Arthur, early in 1898, was followed by the signing of the Russo-Chinese Convention at Peking on March 27, 1898. In substance it leased to Russia Port Arthur and Talién-Wan, together with their adjacent waters, for the term of 25 years from the date of signing of the convention, but provided that at the conclusion of the term it may be prolonged by mutual agreement between the contracting parties. The district (territorial and maritime) is to serve as a depot of military and naval supplies to Russia, and the principal officials administering its affairs are to be Russians. The contracting parties agree to regard Port Arthur as a naval station, to be used by Russian and Chinese ships only, and neither the men-of-war nor the merchantmen of any other power shall have access to it. In the same article (No. 6) it says: "Similarly, in the case of Talién-Wan Bay, one part shall serve as a naval station for the warships of China and Russia, but the rest shall be a commercial port, open for the ingress and egress of the ships of all nations." In view of the importance of Port Arthur and Talién-Wan, Russia undertook to construct, at her own expense, whatever barracks and forts might be required, and to adopt whatever other means were necessary for the defense of those places. Russia is permitted to construct a railway from a point on the Trans-Asian trunk road (for the building of which China gave her consent in 1896) to Talién-Wan, all the details of construction to be in accordance with the Chinese system of Manchurian lines; and a branch of the road may be carried from some place midway between

New-Chwang and the Yalu river to a convenient point on the sea-coast.

Before the convention with Russia was signed France demanded that China should not cede any portion of the four provinces of Kwang-Tung, Kwang-Si, Yun-Nan, and Kwei-Chau, that the railroad from Lung-Chau-Ting, on the N. frontier of Tonquin, should be extended by way of Pase, Siam, into the Yun-Nan province, and that a coaling station be granted to France at Lei-Chau-Fu, in the Hen-Chau Peninsula (N. of Hai-Nan).

Early in 1898, the British Minister, in conference with the Chinese foreign office, demanded a compensatory concession for the purpose of maintaining the balance of power in the Far East, and on April 2 he obtained a lease of the islands and waters of Wei-Hai-Wei on the same terms as those by which Russia had secured Port Arthur; and on May 24, the English occupied the port. On June 9, China ceded to England territories on the main-land opposite Hong-Kong, including the island of Lau-Tao and all the peninsula to a line joining Mirs bay and Deep bay, both of which are included in the lease, China retaining the N. shores. In September, 1898, the emperor issued a number of edicts advocating reforms after European methods in the financial and general administration of the central and provincial governments. These met with the severe disapproval of Tsu-Hsi, the Empress Dowager, and her strong anti-foreign party on the Court. On Sept. 22 she obtained from Emperor Hwang-Su an edict restoring the regency, which she had held previous to his accession in 1889; retired him on a pretense of illness; assumed charge of the government, and decapitated the leaders of the reform party, degraded others, and kept the rest in fear of a similar fate.

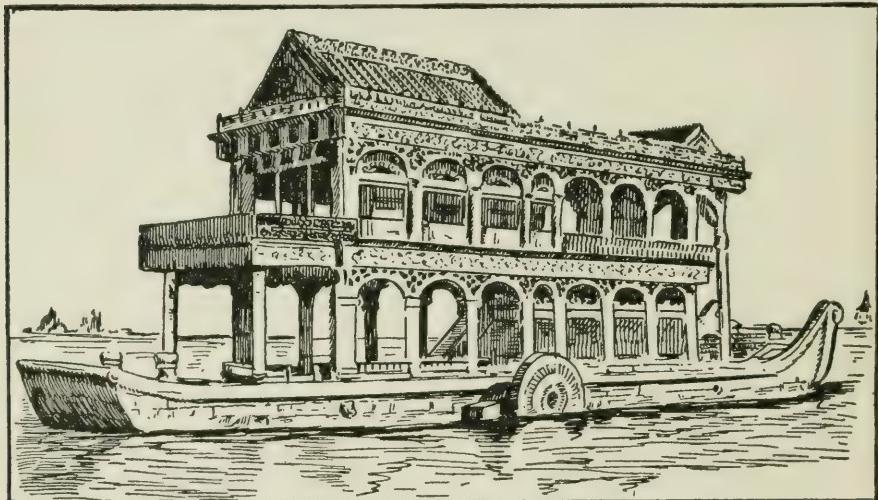
In September, 1899, Secretary Hay instructed the United States representatives in England, France, Germany, Russia, Italy, and Japan to invite from those governments a presentation of their intentions in regard to the treatment of the commerce of foreign powers in the newly acquired spheres of influence, with special reference to the treaties existing between China and the United States, advising that China be regarded as heretofore as an open market for the world's commerce, and that all possible steps be taken to establish much-needed administrative reforms and to preserve and strengthen the Imperial government in its integrity. On March 20, 1900, Secretary Hay announced that all the powers concerned had accepted the proposals

of the United States, and that he would consider their consent final and irrevocable.

The intense anti-foreign sentiment among the Chinese reached a crisis in the Boxer uprising of 1900. The murder of many of the missionaries in the N. provinces, and finally the isolation of Peking and the siege of the legations, called for forceful intervention on the part of the powers. The first international relief expedition under Admiral Seymour left Taku on June 10; was unable to reach Peking, and was forced back by the Boxers. It was only able to retreat with the greatest danger and difficulty, and but for timely re-enforcement would undoubtedly have been cut to pieces. On June 17 the Taku forts

Boxers, who were constantly being reinforced by Imperial troops. The court fled into Shensi before the allies reached Peking. The subsequent military operations consisted chiefly of punitive expeditions to the S. and W. Negotiations for peace were at once begun. On Dec. 4, the powers sent a joint note to the Chinese peace commissioners, to be submitted to the emperor. The note demanded, among other acts, the execution of the leaders in the massacre of foreigners and the payment of an indemnity, which in October, 1901, was fixed at \$735,000,000. On the ratification of the indemnity agreement and 11 other articles of concession, the foreign troops were withdrawn from Peking.

On the close of the Boxer movement



THE MARBLE BOAT AT THE SUMMER PALACE, PEKING, CHINA

at the mouth of the Pei-ho river were reduced, having opened fire on the international squadron anchored in the bay. On July 14 the city of Tien-Tsin was taken by the allies and made the base of the international expedition for the relief of the legations in Peking, which started on Aug. 4. Peking was entered Aug. 15, after some hard fighting, and the foreign ministers, and their families, the legation guards, and the people who had made their way in safety to the legations for protection, were relieved. The raising of the siege, which had existed from June 11, was most timely, as the ammunition of the besieged was almost exhausted, and all of the foreigners were suffering greatly from confinement and the apprehension of a terrible fate in case they should be unable to hold out against the continuous attacks of the

and the return to Peking of the Imperial family (Jan. 7, 1903), the Manchurian question came to the foreground. Russia's shifting policy with regard to the evacuation of Manchuria brought about the Russo-Japanese war. The result of it is that, according to the treaty of Portsmouth, Manchuria, with the exception of a part of the Liao-tong Peninsula, was returned to China (1905). In the same year a strain between China and the United States was brought about by the restriction of Chinese immigration, in consequence of which all American goods were boycotted in China. In the following year China was asked to introduce certain reforms into her administration. These were to a certain extent carried out, one of them being the abolition for ten years of smoking opium. In September, 1907, the Emperor issued an

edict that within 9 years the first Imperial Parliament would be convened. Commissions were sent to Europe to study commercial and educational matters. In 1908 the Central Government obtained increased power in consequence of a reform program arranged by common consent of the Empress mother, the Emperor and the Vice-roy Yuan Shih-kai. On Nov. 14, 1908, the Emperor Kwang-hsü died and was succeeded by his three-year-old nephew Puyi. One day later the Empress Dowager, whose influence in the Central Government was great, died. The ruler of China became the Regent Tchun, the father of the infant Emperor.

China became a republic on Feb. 12, 1912. The Manchu dynasty had its last representative in the infant emperor Puyi who abdicated on that date when he was six years old. The first full President of the new republic was Yuan Shih-kai, who was elected Oct. 6, 1913, for a period of five years.

The Government adopted resembled in its main lines that of the United States. There were two houses, the Senate having 264 members and the House of Representatives 596 members. The cabinet contained nine members, the Premier being appointed by the President and the eight other members being chosen by the Premier with the President's approval. The capital was Peking, as it had been under the Empire.

Yuan Shih-kai died June 6, 1916, and was succeeded by the Vice-President Li Yuan-hung. Shortly after the beginning of his administration, he became involved in difficulties with the legislative branch. In June, 1917, the President sent to Parliament a bill demanding war against the Central Powers. German propaganda was busy, and the Parliament voted down the measure. Thereupon the President dissolved Parliament. This action was declared to be arbitrary and unconstitutional, and six provinces seceded and set up a rival government at Canton. Dr. Sun-Yat-sen, assisted by Wu Ting-Fang, former Ambassador to the United States, headed the forces of the secessionists. In the meantime the Premier, Tuan Chi-jui, believing the President too weak to subdue the rebels, organized a party of his own and induced General Chang Hsun to make an attempt to restore the Manchu dynasty. The boy Emperor was in fact reinstated and reigned for the brief period of ten days, when Tuan, who seems to have played a double part, drove out the forces that he had himself urged to enter Peking and posed as the savior of the Republic. The President was so thoroughly cowed by

the attempted royalist coup that he refused to resume his office. Tuan, therefore, requested the Vice-President, Feng Kup-chang to assume the office and issued a call for a new Parliament. Both of these acts were denounced as illegal by the Canton secessionists, and as the latter had been strengthened by the adhesion of part of the Chinese fleet they inaugurated hostilities against the Peking government. At first they were successful, but in March, 1918, they lost Yockow and were forced to evacuate Changsha, the capital of Hunan. After that there were alternate victories and defeats for both sides. Each had about 300,000 men under arms, but the Peking Government was better supplied with artillery and ammunition. The field of operations covered half the area of China. Commerce was paralyzed, agriculture was almost at a standstill and flood and famine added to the horrors of civil war.

This internecine strife was strongly disapproved by the Allies, not only on humane and commercial grounds, but because it diminished the usefulness of China as an ally in the war against the Central Powers. Strong efforts were made to compose the differences between the Canton and Peking governments. These were brought nearer realization by the resignation of Sun-Yat-sen as the leader of the Canton secessionists and the election as President of Hsu-shih-chang, an astute and sagacious statesman. He was elected Aug. 10, 1918, and inaugurated Oct. 10 of the same year. He was moderate and conciliatory and through his efforts the factions were brought to the verge of settlement of the questions at issue between them.

Negotiations had been opened at Shanghai between representatives of the Northern Government and representatives of the Canton Government, the latter having become dissatisfied with the militaristic aims of the Kwang-si and Kwang-tung leaders. This it was expected would have led to a speedy reunion of the main factions whose antagonism had for years kept the Republic in turmoil. New problems developed, however, through the dismissal of General Hsu Chi-Cheng, Resident Commissioner of Inner Mongolia and commander on the north-west frontier. This action had been taken early in July, 1920, and was due to hostile feeling between the Reform party at whose head was General Chang Tso-ling and the Anky party, to which Hsu Chi-Cheng belonged. His colleagues, General Wu Pei-fu and Tsao-Kun took up arms in his behalf and threatened an advance on Peking. This created a panic in the capital. Efforts were made to

compose the quarrel, and the President, Hsu Chi-Cheng, ordered both sides to retire to their barracks and enter upon negotiations. The effort was ineffective, however. Tuan Chi-jui was surprised by Wu Pei-fu's troops south of Nanyau and retreated toward the capital. In the severe fighting that followed July 15-18 the forces of Wu Pei-fu were victorious. The demoralized troops of Tuan Chi-jui were reported as retreating toward Peking. The diplomatic corps in that city served notice on the government that Peking must not be bombarded and that the safety of foreign residents must be assured. The gates of the city were closed and martial law declared. Members of the old imperial family appealed to the foreign legations for protection as they feared that they would be made the victims of propaganda, alleging that General Wu Pei-fu was carrying on a movement for the restoration of the monarchy. A few days later the forces of Tuan were defeated and their leader made an ineffectual attempt to commit suicide.

On Aug. 28, 1920, Dr. Sun-Yat-sen, the first President of the Chinese Republic, Governor Wu-Ting-Fang and other leaders of the Southern Government, issued a proclamation that they looked for the overthrow of the illegal government of Peking through the forces of General Tang, who was holding control over the provinces of Yunnan, Kwei-Chow, and Sze-chuen. Military headquarters for the new government were established in the eastern part of Sze-chuen. In spite of this, however, the Premier announced on Aug. 28 that peace with the Southern Government was an accomplished fact. On Aug. 28 Dr. Paul S. Reinsch, former minister to China, and for several years legal adviser to the Chinese government, resigned his position. A new cabinet was appointed on Aug. 11, 1920.

Relations with Japan.—Shortly after the formation of the Chinese Republic, Japan sought to enforce demands on China that practically robbed her of a large part of her sovereignty. The march of the Japanese on Tsing-tao at the outbreak of the World War had been made through 150 miles of Chinese territory. Against this violation of her neutrality China had protested, but as she had no army or navy that could cope with the Japanese, her protests were unheeded. On Jan. 18, 1915, the Japanese Minister to Peking presented 21 demands on the part of his government. They were made under the plea of "maintaining the peace of eastern Asia and of further strengthening the friendly relations existing between the two neighboring nations."

Space forbids the statement here of all the demands, but, besides, the arrangements regarding Shantung elsewhere alluded to, they included the demands that the leases of Port Arthur, Dalny and the railroads should be extended for 99 years, that Japan should have an equal voice with China in matters relating to south Manchuria and inner Mongolia, that Japanese instructors and advisers should be employed by China and that 50 per cent. of war munitions needed by China should be bought from Japan. Foreign governments were alarmed at the sweeping character of these demands and asked for explanations. They were told in reply that only ten of the articles were really demands, while the rest were requests. Under pressure from her ally, Great Britain, Japan eventually modified some of the demands but remained firm on others, and, on May 6, 1915, issued an ultimatum to China and began to mobilize against her. Under the threat of invasion, China acquiesced and signed away her sovereignty, giving to Japan important concessions that in some cases extended beyond the year 2000.

The Chinese were helpless in the presence of physical force, but they had a potent weapon in the buying power of over 300,000,000 people, and this they proceeded to utilize at once. A boycott was instituted against Japanese goods which resulted in the loss of many millions of dollars by Japanese traders and in many cases led to their bankruptcy. In certain districts goods were burned and widespread disorders occurred. Japan protested, and the instigators of the outbreaks were punished.

China in the World War.—The part taken by China in the World War was a peculiar one, and was largely influenced by her relations with Japan, which had never been cordial since the close of the Chinese-Japanese War. As early as 1914, China had expressed a desire to join in the Anglo-Japanese operations against Tsing-Tao, but an intimation was conveyed to her that her participation might cause complications with other powers. China had especial reason to be incensed against Germany, whose troops had displayed great brutality during the Boxer troubles and who by force majeure had extorted valuable possessions and concessions from her in Shantung province. Again in November, 1915, she sought to range herself upon the side of the Allies, but again she was held in check by the objections of Japan. The motives that actuated the latter nation have been variously explained. By some it was thought that Japan looked with apprehension upon the development of China

as a military power which might have resulted from the raising, training, and equipment of armies. Then too the conjecture has been hazarded that if the war resulted victoriously for the Allies, China might advance claims in the Peace Conference that might threaten the Japanese hegemony in Asia. That this latter motive was a prominent one is

on the question until the war was within a few days of ending in Nov. 1919.

China's active military participation in the conflict was practically nil. She offered to send an army of 100,000 men to the western front, but the offer was declined because of the lack of tonnage. She did, however, contribute the services of 130,000 coolies, who worked behind



TEMPLE OF HEAVEN, PEKING, CHINA

shown by the correspondence between the Russian Ambassador and his government, relating conversations the former had had with Viscount Motono, the Japanese Foreign Minister, in which the Japanese statesman had emphasized the necessity of safeguarding Japan's interests at the Peace Conference. Despite this opposition of her powerful neighbor, however, China formally declared war against Germany, Aug. 14, 1917. The government, in taking this step dispensed with the sanction of Parliament, which was not then in session. The Chamber of Deputies endorsed the action nearly three months later, but the Senate did not vote

the lines in France and Belgium, and thereby released a corresponding number of Caucasians for actual fighting. She was a valuable industrial ally also along the same lines in Mesopotamia and in German East Africa. Many of the British ships were manned by Chinese sailors. Despite this contribution, however, the services rendered by China were thought by the Allies to fall far short of what should have been afforded, and a complaint to that effect was made, on Nov. 4, 1918, when the British Minister at Peking, with the concurrence of the other Allied representatives, handed to the Chinese Government a memorandum

in which it was indicated where the latter had been remiss in fulfilling its obligations. It was claimed that the Boxer indemnities which had been remitted by the Allies in order to foster war industries had been wasted in party squabbles; that enemy property had not been confiscated nor enemy enterprises thwarted as they should have been; in short, that in many respects China had been lukewarm and supine. This was denied, but not convincingly. The result was that when the Chinese delegates appeared at the Peace Conference to claim their share of the fruits of victory, the burden of proof lay with them to show that they were entitled to them.

In the early stages of the proceedings at Paris, a contention arose between China and Japan on the subject of Shantung, second only in importance to the rival claims of Italy and Jugoslavia to Fiume. Shantung was of great value to the Chinese, not only from commercial but sentimental considerations. It was to China what Mecca was to the Mohammedans and Jerusalem to the Jews, their Holy Land, the birthplace of their civilization, hallowed by memories of their great sages, Mencius and Confucius. The Chinese claimed that it belonged to them by right of nationality, that it was Chinese to the core, that it had been torn from them by force and should be returned to them as a matter of right.

Kiao-Chau, an important seaport in the province of Shantung, together with important mining and railway concessions, had been extorted from China by Germany in 1897. In 1914, shortly after the beginning of the World War, Kiao-Chau was captured mainly by Japanese forces, though British naval forces co-operated in its capture. Germany had been ousted from that section of the world, and Japan remained in undisturbed possession until the close of the war. An agreement was made in 1915 between China and Japan, in which the former agreed in advance to any arrangement that might ultimately be made by Japan with Germany regarding the disposition of the territory. Japan at the same time promised that in return for certain important concessions, she would eventually restore Kiao-Chau to China. Before the Peace Conference, Japan urged that what she had taken from Germany in actual fighting ought to remain hers by right of conquest, though she still adhered to her promise to restore the territory eventually to China. This was vague and unsatisfactory, for Japan refused to specify a date for the return. She might make it one year or a hundred, as she chose. China's contention was that her entrance

into the war against Germany, even at a late date, abrogated any treaty that she had with the vanquished power and that therefore Kiao-Chau reverted to her automatically, and that the railway and mining concessions were likewise abrogated. So strongly did she feel on the subject that her delegates asserted that they had received instructions from their government not to sign the treaty, if their claims were not granted.

Had the matter been open to free and fair debate, the decision of the conference on the conflicting claims might have been different. But it soon developed that the Allied powers were pledged in advance to support the claims of Japan. It was wholly unknown to the American delegates that a treaty had been entered into in 1917, between Japan and Great Britain, Russia, France, and Italy, by which the four latter Powers agreed to support Japan's claims at the Conference in reference to Shantung, in return for Japan's undertaking to permit China to enter the war. The existence of this secret treaty was only revealed in answer to a casual question of President Wilson. Under these conditions, it was a foregone conclusion that the decision would go against China. It was officially announced, on April 30, 1919, that the Shantung Peninsula and Kiao-Chau were to be given without reserve to Japan, who in turn was to withdraw her military forces and ultimately return to China full sovereignty over the disputed territory. The point was made that instead of doing this at the summary command of the Peace Conference, Japan should do it in her own way and at her own time as a free agent. No date was specified, as Japan objected to this as a reflection on her good faith. Besides the railroad and other concessions that she held as the legatee of Germany, Japan was to be allowed to establish a settlement at Tsing-tao, south of Kiao-Chau.

The decision aroused great resentment among the Chinese delegates. They cabled to Peking for instructions and were told not to sign the treaty, the intimation being given that if they did, their lives would not be safe on their return to China. Excitement and disorders broke out in Chinese cities and protests poured in from Chinese communities and associations all over the world. A special additional commission was sent to Paris to urge the Conference to reconsider its decision. Members of the commission expressed the conviction that if Japan controlled the rich Shantung province, with what was considered the best seaport of the Republic, she would soon dominate northern China.

gradually extend her control to southern China, and then, when she felt strong enough, proclaim a Monroe Doctrine of the Orient. Protests were unavailing, however, and the decision stood. China refused to sign the treaty.

CHINA SEA, that part of the North Pacific Ocean bounded N. by Formosa, N. W. by China, W. by Anam and the Malay peninsula, S. E. by Borneo, and E. by the Philippines. It contains numerous islands, receives several considerable rivers, and forms the important gulfs of Siam and Tonquin.

CHINCHILLA, a genus of South American herbivorous rodents very closely allied to the rabbit, which they resemble in the general shape of the body, in the limbs being longer behind than before, in the conformation of the rootless molars, and by the nature of the fur,



CHINCHILLA

which is more woolly than silky; but differing from the rabbit in the number of their incisors and molars, in a greater length of tail, and also in having broader and more rounded ears. *C. lanigera*, a species about 15 inches long, is covered with a beautiful pearly-gray fur, which is highly esteemed as stuff for muffs, pelisses, linings, etc. The chinchilla lives gregariously in the mountains of most parts of South America, and makes numerous and very deep burrows. It is of a gentle nature, very sportive, losing none of its gaiety in captivity, and very cleanly.

CHINDA, VISCOUNT SUTEMI, a Japanese diplomat; born at Hirosaki in 1856. He received his education at De-pauw University, Indiana. He began his diplomatic career in the Japanese foreign office in 1886; was consul at San Francisco in 1890 and consul-general at Shanghai in 1895. His long diplomatic career has included ministries to Brazil, the Netherlands, and Russia. From 1908 to 1911 he was ambassador to Germany, from which post he was transferred to

Washington, where he served until 1916. In the latter year he was made ambassador to Great Britain. He showed marked ability in the many positions he has held, and ranks high among diplomats. He was one of the representatives of Japan at the Versailles Peace Conference in 1919.

CHINESE WALL. See CHINA.

CHINESE WHITE, the white oxide of zinc, a valuable pigment introduced into the arts as a substitute for the preparations of white-lead.

CHING-HAI, or **CHIN-HAI**, a seaport of China, in the province of Cheh-Chiang (Cheh-Kiang), about 15 miles from Ning-Po. Pop. about 150,000.

CHIN-KIANG, or **CHIN-CHIANG**, a city of China in the province of Kiang-Su (or Chiang-Su) about 490 miles S. of Tien-Tsin. Chin-Kiang was declared a treaty port in 1861. The main port fronts on the Yang-Tse-Kiang, about 150 miles from its mouth, being accessible to large ships. Pop. about 150,000.

CHINON (shē-nōn'), an antique town in the French department of Indre-et-Loire, beautifully situated on the Vienne, 31 miles S. W. of Tours. Crowning a lofty rock are the ruins of its vast old castle, the "French Windsor" of the Plantagenets, the deathplace of Henry II.; and later the residence of several French sovereigns, where, in 1429, Joan of Arc revealed her mission to the Dauphin. A farmhouse across the Vienne is pointed out as Rabelais' birthplace.

CHINOOK, a term applied to a strong, warm, and dry south or west wind, which descends into the eastern slopes of the Rocky Mountains, into Montana and Wyoming, where it evaporates or melts the snow and brings relief in cold weather. The name was probably given to it because the wind occurred in the territory occupied by the Chinook Indians.

CHINOOKS, a tribe of Indians, now nearly extinct, on the Columbia river, or in Oregon.

CHINS, a savage tribe living in the mountainous region between lower Bengal and upper Burmah, of very primitive habits.

CHINTZ, a highly calendered cotton gaily printed with designs of flowers, etc., in five or six different colors.

CHIOGGIA (kē-ōj'yā), or **CHIOZZA**, an important seaport town of northern Italy, 15 miles S. S. W. of Venice, on an

island at the S. end of the Venetian Lagoon, connected with the mainland by a stone bridge of 43 arches. It is founded on piles, and has a cathedral; its harbor, the deepest in the lagoon, is guarded by forts and batteries. Pop. about 40,000, most of them engaged in the coasting trade, lace-making, weaving, shipbuilding, and fishing.

CHIOS (now called by the natives *Chio*, Italianized into *Scio*), one of the most beautiful and fertile islands in the Ægean Sea, formerly belonging to Turkey, now a possession of Greece, 7 miles off the coast of Asia Minor, at the entrance to the Gulf of Smyrna; about 30 miles long from N. to S., by 8 to 15 miles broad, with a coast-line of about 110 miles, an area of 320 square miles, and a population of about 75,000, almost all Greeks. The larger N. part is more mountainous than the S. The climate is delightful and salubrious. Earthquakes are, however, not rare, and one in 1881 caused the death of 3,558 persons, and the destruction of much property. The wine produced on the N. W. coast, the *Vinum Arvisium* of ancient times, is still esteemed. Other products are figs, also noted in classical days; mastic, silk, lemons, oranges, and olives. Goats' skins are also exported. The capital, Chios, about the middle of the E. coast, contains about 15,000 inhabitants, and has a haven touched by various services of steamers, and doing a good trade. On the W. coast is a rich monastery, Nea-Moni, founded in the 11th century. In ancient times excellent marble and potters' clay were quarried in the mountains, and recently pits of antimony and ochre have been worked.

CHIPMUNK, a small animal much like a squirrel, of the genus *Tamias*, known as the striped squirrel. The common chipmunk has a body five or six inches long, and a tail which is not so bushy as in other squirrels, and a little shorter. The fur is yellowish-brown mixed with gray above and white below, and the back and sides are marked with five black stripes running lengthwise. The feet are large and fitted with strong claws for digging. They burrow deep into the ground, usually under the roots of a tree or under a stone wall, and make a round nest at the bottom, generally with two entrances.

CHIPPENDALE, THOMAS, an English cabinet-maker; went to London from Worcestershire before 1750. The style of furniture named after him was less heavy and severe than that of his successors, and was rather elaborate, deli-

cate, and baroque, with classical tendencies. He wrote a "Cabinet-maker's Director" (1752). He died in 1779. The term "Chippendale" is often used to designate 18th century furniture in general.

CHIPPEWA FALLS, a town and county-seat of Chippewa co., Wis.; on the Chippewa river, and the Chicago, Milwaukee and St. Paul, and other railroads; 12 miles N. E. of Eau Claire. It is the seat of the County Insane Asylum and the State Home for the Feeble-Minded, and has important manufactures, large water power from the river, electric lights, and street railways, daily and weekly newspapers, two National banks, etc. Pop. (1910) 8,893; (1920) 9,130.

CHIRIQUI (chē-rē-kē'), an administrative division of the Republic of Panama, adjoining Costa Rica; area, about 6,500 square miles; pop. about 43,000. It is well wooded, and has rich pasturage, especially on the Atlantic coast. The Cordilleras that occupy the interior reach their highest point in the volcano of Chiriquí (11,265 feet). Chief town, David. On the N. coast is a spacious lagoon of the same name, with a depth of water for the largest ships, which receives the unimportant Rio Chiriquí.

CHIROMANCY. See PALMISTRY.

CHIROPRACTIC, a drugless method of healing founded on the principle that interference with vital energy in its passage through the nerves is the cause of disease and that relief of such interference restores health to abnormal organs. Chiropractic was originated by D. D. Palmer in Iowa in 1895. The chiropractor claims that, in the body, every tissue, every function, is dependent upon vital energy, called "mental impulses," supplied through the nervous system from its center, which is the brain. The only place where interference can take place in this transmission is where the nerve trunks emerge from the spinal column through the tiny openings between adjacent vertebrae. If these vertebrae are displaced, the size of the openings is decreased and the nerve fibers are impinged on. Health is to be restored by locating the spinal abnormality and, by manipulation, relieving the pressure on the nerve fibers. The Palmer School of Chiropractic, Davenport, Iowa, the parent institution, is headed by Dr. B. J. Palmer, son of D. D. Palmer. By 1922 there were about 15,000 chiropractors in the United States.

CHISELHURST, or **CHISLEHURST**, a village in Kent, England, 11 miles S. E. of London. Napoleon III. died here at Camden House in 1873.

CHISHOLM, a city in Minnesota, in St. Louis co. It is on the Great Northern, and the Duluth, Missabe, and Northern railroads. It is the center of an important agricultural and lumbering region, and has large deposits of iron ore, the mining of which is the chief industry. Pop. (1910) 7,684; (1920) 9,039.

CHITRAL, a small mountain state in the upper basin of the Kashkar or Kunar, a tributary of the Kabul river, and bordering on Kashmir and Kafiristan, is 5,200 feet above sea-level. The people are Moslems, but mostly speak a language closely akin to that of their pagan neighbors in Kafiristan. Pop. about 175,000.

CHITTAGONG, a district of Hindustan, in the S. E. of Bengal, having the Bay of Bengal on the W.; area, 2,567 square miles; pop. about 1,750,000. The level lands, chiefly on the coast and the valleys, are very fertile. A considerable majority of the inhabitants are Mohammedans. The city of Chittagong, chief town of the district and an important port of Bengal, is on the Karnaphuli river, about 12 miles from its mouth. Though very unhealthy, its trade has been steadily increasing. Pop. about 25,000.

CHITTENDEN, RUSSELL HENRY, an American educator; born in New Haven, Conn., Feb. 18, 1856. He was graduated at Yale in 1875, and took a course at Heidelberg. He became Professor of Physiological Chemistry at Yale in 1882, and in 1898 director of the Sheffield Scientific School. He was a member and at times an officer of many scientific societies and, in 1919, served as United States representative on Inter-Allied Scientific Food Commission at London, Paris, and Rome. He wrote "Digestive Proteolysis" and similar works.

CHITTENDEN, THOMAS, an American colonial and State governor; born in East Guilford, Conn., Jan. 6, 1730. He was one of the pioneers of Vermont, settling upon the New Hampshire grants in 1774, and acquiring a fortune from his lands. In 1778 he became governor of Vermont, before its formal separation from New York was recognized. During the Revolutionary War the British and the Continental Congress received overtures from him, his terms being recognition of Vermont's statehood. He retired from public life in 1796 and died in Williston, Vt., Aug. 24, 1797.

CHITTY, JOSEPH, an English lawyer and legal writer; born in 1776. He achieved eminence as a barrister in Lon-

don, and enjoyed a large practice. His celebrity rests mainly upon his legal works, especially "Precedents in Pleadings," "Medical Jurisprudence," "Practice of Law," and others. He died in London, Feb. 17, 1843.

CHIUSI (kē-ōs'ē), a town of central Italy, province of Siena, 102 miles N. N. W. of Rome, on an olive-clad eminence in the Val di Chiana, not far from the small Lago di Chiusi. In ancient times, under the name of Clusium, it was one of the 12 republics of Etruria, and the residence of Porsenna. When Italy was overrun by the barbarians, it fell into decay, the whole valley was depopulated, and became the pestilential pool described by Dante. Since the improvement of the course of the Chiana, Chiusi has begun to flourish again along with the whole district. It is in connection with the discovery of Etruscan antiquities, however, that the place is chiefly heard of. During the 19th century immense quantities of these remains were found in the neighborhood in the grottoes that served the ancient Etruscans as tombs. They consist chiefly of sun-dried black earthenware vases, ornaments, reliefs, and carved stonework, and are preserved in the museums at Chiusi and Florence. Pop. about 6,000.

CHIVALRY, the uses and customs pertaining to the order of knighthood. From the 9th to the 12th century, a "miles," that is, one bearing a designation which in classical times meant simply a soldier, and in the medieval period a knight, was one who held land in fee from a superior, and was in consequence bound to render him military service. When a young man who was heir to these responsibilities came of age enough to formally pledge himself to discharge them honorably, a ceremony of investiture took place. The Church, as was natural and right, sought to add solemnity to the interesting event, and made the investiture of a youthful knight an imposing religious ceremony, holding up, moreover, before him a high moral and religious ideal to which he was exhorted to aspire. Mercy to vanquished foes and purity in the youthful knight's relations to women were earnestly pressed upon him; and there was undoubtedly more of both than if the Christian Church had not interfered. Yet withal the ages of chivalry were marked to a frightful extent by cruelty and impurity. While the Church counseled and poets celebrated the religious and moral elevation of the true knight, that individual himself manifested little of either; his principles and his prac-

tice were wonderfully different. Chivalry declined and fell with the feudal system, of which it was a normal growth. The institution of the military orders, the Knights Templar, the Knights of St. John, and the Teutonic Knights, was an interesting development of mediæval chivalry.

CHLORAL (C_2HCl_3O or $CCl_3CO.H$ = trichloraldehyde), a colorless, odorous, oily liquid, boiling at 94° . It is obtained by passing chlorine gas through absolute alcohol. With water it forms a crystalline compound called hydrate of chloral, $CCl_3.HC(OH)_2$.

CHLORAL HYDRATE, a white crystalline substance, forming a neutral aqueous solution if free from HCl. It produces sleep, but only acts as an anodyne during sleep, the pain returning as soon as the patient wakes. The habitual use of this drug is followed by profound melancholy and enfeeblement of will, and muscular lassitude and suicidal insanity. It was discovered by Dr. O. Liebreich.

CHLORINE, a monatomic element; symbol Cl; at. wt. 35.5. Discovered by Scheele in 1774. It was thought by Berthollet to contain oxygen, and was called by him oxymuriatic acid. It was found to be an element by Davy in 1810. Chlorine is a yellow-green incombustible gas. It has a powerful irritating smell, and attacks violently the mucous membranes and the lungs. It is very soluble in water, acts strongly on metals, and is best collected by displacement. Sp. gr. 2.47. At the pressure of five atmospheres it is condensed into a heavy yellow liquid. It is obtained by heating common salt, sodium chloride, with sulphuric acid and black oxide of manganese. It combines with hydrogen to form hydrochloric acid, with an explosion in direct sunlight or when fire is applied to a mixture of the two gases, but slowly in diffused daylight. A solution of it in water is gradually converted in the sunlight into HCl with liberation of oxygen. A lighted candle burns in Cl with a smoky flame. Phosphorus, antimony, arsenic, and turpentine take fire in chlorine. Chlorine destroys animal and vegetable matter; and forms addition and substitution compounds with organic compounds; an aqueous solution of it has powerful bleaching properties. It is also a powerful disinfectant. It occurs in nature in the form of metallic chlorides. Three oxides of Chlorine are known, Cl_2O ; Cl_2O_3 ; Cl_2O_4 . Chlorine was extensively used during the World War in connection with the manufacture of ASPHYXIATING GAS (q. v.).

CHLORITE, a mineral of a grass-green color, opaque, usually friable or easily pulverized, composed of little spangles, scales, prisms, or shining small grains, and consisting of silica, alumina, magnesia, and protoxide of iron. It is closely allied in character to mica and talc.

CHLOROFORM ($CHCl_3$, trichloromethane), is formed by the action of the sun's rays on a mixture of chlorine and marsh gas; also by the action of caustic potash on chloral or chloracetic acid, or by the action of nascent hydrogen on tetrachloride of carbon. It is prepared on a large scale by distilling water and alcohol with bleaching powder. Chloroform is a colorless, mobile, heavy, ethereal liquid. Specific gravity, 1.5. It boils at 62° ; its vapor density is four times that of air; it is nearly insoluble in water, but dissolves readily in alcohol. It has a sweet taste. It dissolves caoutchouc, resins, fats, alkaloids, etc. It should not be exposed to the light, as it may decompose, hydrochloric acid and chlorine being set free.

Chloroform is used in medicine, dissolved in alcohol, under the name of chloric ether, as a stimulant. Chloroform taken internally acts as a narcotic, sedative, and antispasmodic, and is given in cases of asthma, colic, and cholera, also for neuralgia. *Linimentum Chloroformi*, equal parts of Chloroform and camphor liniment, is used externally to allay pain and irritation in neuralgia and itching.

The vapor of Chloroform, when inhaled for some time, produces a temporary insensibility to pain. Inhaled in small doses it produces pleasurable inebriation, followed by drowsiness; in larger doses it causes loss of voluntary motion, suspension of mental faculties, with slight contraction of the muscles and rigidity of the limbs; then if the inhalation is continued a complete relaxation of the voluntary muscles takes place, but if carried too far it causes dangerous symptoms of apnoea or of syncope, and the patient must be restored by artificial respiration. Chloroform should not be administered to persons suffering from cerebral disease or organic cardiac affection. Dr. Simpson, of Edinburgh, in 1847, began to employ the vapor as a means of producing anaesthesia or insensibility, partial or complete.

CHLOROSIS, one of the most formidable diseases to which plants are liable, and often admitting of no remedy. It consists of a pallid condition of the plant, in which the tissues are weak and unable to contend against severe

changes, and the cells are more or less destitute of chlorophyll. It is distinct from blanching, because it may exist in plants exposed to direct light on a south border, but is often produced or aggravated by cold, ungenial weather and bad drainage. The most promising remedy is watering them with a very weak solution of sulphate of iron. Many forms of the disease exist, of which those of clover, onions, cucumbers, and melons are best known.

In medical practice, an affection in which the skin of the body, and especially that of the face, assumes a peculiar greenish cast, and hence is popularly known as green-sickness. The condition is closely allied to anaemia, and often associated with menstrual disturbances of variable nature. Chlorosis occurs chiefly among young and delicate women who lead sedentary lives under unwholesome conditions.

CHOATE, JOSEPH HODGES, an American lawyer and statesman; born in Salem, Mass., Jan. 24, 1832. He was a descendant of John Choate, who came from England in 1640. He was graduated at Harvard College in 1852; admitted to the bar in Boston in 1855; re-



JOSEPH H. CHOATE

moved in 1856 to New York, where he became a partner in the law firm of Evarts, Choate and Beaman. His ability as a lawyer and public speaker soon gave

him a reputation which had seldom been equaled among the leaders of the New York bar. Although he never sought public office, he, at times, took an active



RUFUS CHOATE

interest in politics with the aim of raising their standard. On Jan. 12, 1899, he was appointed by President McKinley ambassador to England. The appointment was promptly confirmed by the Senate and gave great satisfaction throughout the country and in England. He served with great success until 1905, received honorary degrees from Oxford, Cambridge, Edinburgh, Glasgow, and St. Andrew's Universities, and was made a Bencher of the Middle Temple, being the first American to receive this honor. In 1907 he was United States delegate to the International Peace Conference at The Hague. In the World War his sympathies were with the Allied cause from the beginning. He was a member and, at times, an officer of many legal and patriotic societies, and the recipient of honorary degrees from numerous universities in this country and Canada. His addresses and orations were published (2 vols., 1910-1911). He died in New York, May 14, 1917.

CHOATE, RUFUS, an American lawyer; born in Essex, Mass., Oct. 1, 1799. In 1830 and 1832 he was elected to Congress. In 1841 he succeeded Daniel Webster as United States senator from Massachusetts, serving until 1845. In many respects he was the most scholarly of American public men, and among the greatest forensic advocates the United States has produced. He died in Halifax, N. S., July 13, 1859.

CHOCOLATE, a preparation of the seeds of *Theobroma Cacao*, made by grinding the seeds mixed with water to a very fine paste. The mill is usually constructed of heavy metal rollers turning in a circular course upon a flat metal plate. A curved knife or scoop is attached to the rollers in such wise that it shall return the paste continually to be crushed and recrushed by the rollers until it becomes almost impalpable. The object of this is to render the nut, otherwise difficult of solution, readily diffusible in water or milk when used as a beverage. The paste when unmixed, or mixed only with flour or other farinaceous material, is usually called cocoa, but when much sugar or spices such as vanilla, cinnamon, etc., are added, it bears the name of chocolate. The two names are much confounded commercially. Chocolate is molded into cakes or sold in powder or flakes formed by simply drying the paste as it comes from the mill. The seeds or nuts contain a large proportion (30 to 50 per cent.) of oily matter (cocoa butter). This may be partially removed or all retained in the chocolate. In the latter case much of it is mechanically adherent to the sugar or farinaceous matter. Chocolate is a favorite beverage in Spain, Italy, and other S. countries, especially for breakfast; the cake or powder is heated and diffused in water or milk with much stirring. The Italian rarely uses butter, but cuts his bread into sippets and dips them in his chocolate, the oily matter of which performs the same nutritive functions as the butter we spread on our bread. It is sometimes mixed with coffee in Italy, and there known as *mischiate*. It is also made into a paste with cream and sugar and frozen as Chocolate ice. Vanilla is the favorite flavoring. The name appears to be Mexican, *Chocolatl* (*choco*, "cocoa," and *latl*, "water"). It was introduced from America to Europe by the Spaniards. It is highly nutritious, containing a large proportion of nitrogenous flesh-forming material. On this account it is used as portable food by many mountaineers. An excessively rich food is obtained by preparing it with milk and then whisking in a raw egg. In the solid form, mixed with much sugar, cream, and various confections, Chocolate is largely used as a sweetmeat, and is introduced in pastry.

CHOCTAWS, an Indian tribe, occupying a reservation in Oklahoma State. Grain, cotton, and fruit are raised by the tribe. They number about 15,000.

CHOISEUL (shwäz-el'), an ancient French family which has furnished

many distinguished individuals. One of the best known is Étienne François, duke of Choiseul-Amboise, born in 1719, died 1785. He entered the army in early life, and, after distinguishing himself on various occasions in the Austrian War of Succession, returned to Paris, where his intimacy with Madame de Pompadour furnished the means of gratifying his ambition. After having been ambassador at Rome, and at Vienna, where he concluded with Maria Theresa the treaty of alliance against Prussia, he became in reality prime minister of France, and was very popular through a series of able diplomatic measures. He negotiated the famous Family Compact which reunited the various members of the Bourbon family, and restored Corsica to France. His fall was brought about in 1770 by a court intrigue, supported by Madame du Barry, the new favorite of the king. He was banished to his estate, but his advice in political matters was frequently taken by Louis XVI.

CHOLERA, a Greek term used in the Hippocratic writings, but of indeterminate etymology, being derived perhaps from *chole*, bile, or from *cholera*, a water-spout, or gutter. It is now universally employed in medicine as indicating one of two or three forms of disease, characterized by vomiting and purging, followed by great prostration of strength, amounting in severe cases to fatal collapse. The variety called *cholera sicca* (dry cholera), by ancient writers, in which collapse and death take place without discharges, is comparatively rarely observed. The milder forms of Cholera occur almost every summer and autumn, even in temperate latitudes, while the more devastating and fatal forms of the disease are generally supposed to originate only in tropical countries—especially in India—and thence to be propagated epidemically over vast populations, and in a somewhat irregular geographical course. The very fatal forms of the disease are commonly called Asiatic, Oriental, or Epidemic Cholera; sometimes Cholera Morbus, or Pestilential Cholera. The great Hindu festivals take place every 20 years, and always commence on April 12. The danger of the conveyance of Cholera to the countries of Europe is largest at these periods. Cholera never originates at Mecca, but is always conveyed there from Hindustan; but fortunately the Mecca festivals rarely coincide in date with those of India. What is called Cholera morbus is a bilious disease, long known in most countries, and is characterized by copious vomiting and

purgings, with violent griping, cramps of the muscles of the abdomen and lower extremities, and great depression of strength. It is most prevalent at the end of summer or the beginning of autumn. Cholera infantum (infants' cholera) is the name sometimes given to a severe and dangerous diarrhoea to which infants are liable in hot climates or in the hot season.

It is now beyond question that cholera, or Asiatic cholera as it is usually called, is caused by the growth of a germ, *Vibrio cholerae*, discovered by Koch in 1883. During epidemics this organism is found in the intestinal canal of healthy persons, as well as cholera patients, so it is clear that the germ alone is not sufficient to cause the disease. Its malignancy appears to depend upon a run-down or weakened condition of the body. If this exists death may follow within twenty-four hours. In a well person the presence of the vibrio may cause no sickness. These cholera carriers, well themselves, but alive with germs, may play an important part in the spread of the disease. It is now generally believed that insects, and particularly flies, are agents in spreading cholera. They infect exposed foods with the vibrio; water and milk also carry infection during epidemics, as well as raw vegetables. Prevention is largely a matter of situation, and the protection from pollution of food, milk and water.

Treatment.—A number of sera have been tried as prophylactics and cures. That of Kolle has given some success, but Haffkine's is the best known and probably the most efficient up to date. The latter is prepared by passing cholera germs through a series of rabbits, and growing the final product on an artificial culture medium. The artificial growth is used for direct injection into the human body. Persons so vaccinated are somewhat less likely to contract cholera than the unvaccinated, and the protection is said to last about fourteen months. Strong's vaccine is prepared by spraying artificial cultures over broths, then incubating the latter at body temperatures, and finally filtering the product through a Reichel candle (an unglazed porcelain filter worked by a vacuum pump), which extracts all the germs and gives a sterile product for inoculation. The vaccine treatment of cholera, however, is still in the experimental stage.

CHOLULA (chō-lō'lā), a decayed town of the Mexican State of Puebla, stands nearly 7,000 feet above sea-level, on the tableland of Anahuac, 55 miles E. S. E. of the city of Mexico. Cortes found in

it 40,000 houses and 400 temples, including the great Teocalli. Now the place only contains 9,000 inhabitants. It was a great center of the Aztec religion.

CHONOS ARCHIPELAGO, a group of islands lying off the W. coast of Chile, mostly between lats. 44° and 46° S., and lon. 74° and 75° W. Two are large, but they are all barren and scantily inhabited.

CHOPIN, FRÉDÉRIC FRANÇOIS, a Polish composer and pianist, born near Warsaw in 1810. His musical education began when he was still a mere boy and before he was 9 years of age he played in public. In August, 1829, he gave two concerts in Vienna and his playing was widely praised by many musical celebrities who were present. This was followed by concerts in Warsaw, Munich, and other cities. As a result of the



FRÉDÉRIC FRANÇOIS CHOPIN

Russian occupation of Warsaw in 1831 he removed to Paris, which was his home for the next 18 years. During this period he was surrounded by many men and women of genius and talent and he was one of the most conspicuous figures of this circle. During his residence in Paris he wrote and published many important musical compositions. He made also frequent appearances as

a pianist. In 1835 he visited Germany, Leipsic, and other cities, and in the same year made a trip to England, which, while it lasted only 11 days, was sufficient to develop the germs of consumption. In 1837 he met George Sand who was then living separately from her husband. Chopin was at the time ill and she undertook to nurse him, and, in the years following, they lived in Paris, where they were both conspicuous in social and musical circles. A break in their relations came in 1847 as the result of a quarrel. Chopin continued to give concerts in spite of the fact that he continually grew weaker physically. He visited London again in 1848. He died in 1849. Chopin is considered to be the creator of a new style of writing for the piano, and his achievements as a composer entitle him to a foremost place among the masters of music.

CHOP-STICKS, the Chinese substitute for a knife, fork, and spoon at meals, consisting of two smooth sticks of bamboo, wood, or ivory, which are used for conveying food to the mouth with wonderful dexterity.

CHORAZIN, one of the cities in which Christ's mighty works were done, but named only in his denunciation (Matt. xi: 21; Luke x: 13).

CHORD, in music, the simultaneous and harmonious union of different sounds, at first intuitively recognized by the ear, and afterward reduced to a science by the invention of the laws or rules of HARMONY (*q. v.*).

In geometry, a chord is the straight line which joins the two extremities of the arc of a curve. The chord of a circular arc is obtained by multiplying the radius by twice the sine of half the angle which the arc subtends at the center.

CHOREA, more fully *Chorea Sancti Viti*, St. Vitus' dance, a disorder of the nervous system characterized by a peculiar convulsive and irregular action of the voluntary muscles, especially those of the face and extremities. The name is derived from St. Vitus, who is said to have had the power of curing persons afflicted with that disease.

CHORON, ALEXANDRE ÉTIENNE (*shō-rōn'*), a French musician; born in Caen, Oct. 21, 1772. He labored assiduously to promote musical education in France, founding his famous "Conservatory" in 1818. He wrote many valuable text books on music. He died in Paris, June 29, 1834.

CHOSEN. See KOREA.

CHOSROES I., (*chos'rōz*), or **KHOSROU THE GREAT**, King of Persia, succeeded Cabades, A. D. 551. He was fierce and cruel but possessed many good qualities, and encouraged the arts and sciences. He concluded a peace with the Romans, but afterward invaded their territories, and was repulsed by Belisarius. In the reign of Justinian II., he attacked the Romans again, but was defeated by Tiberius. He died in 579.

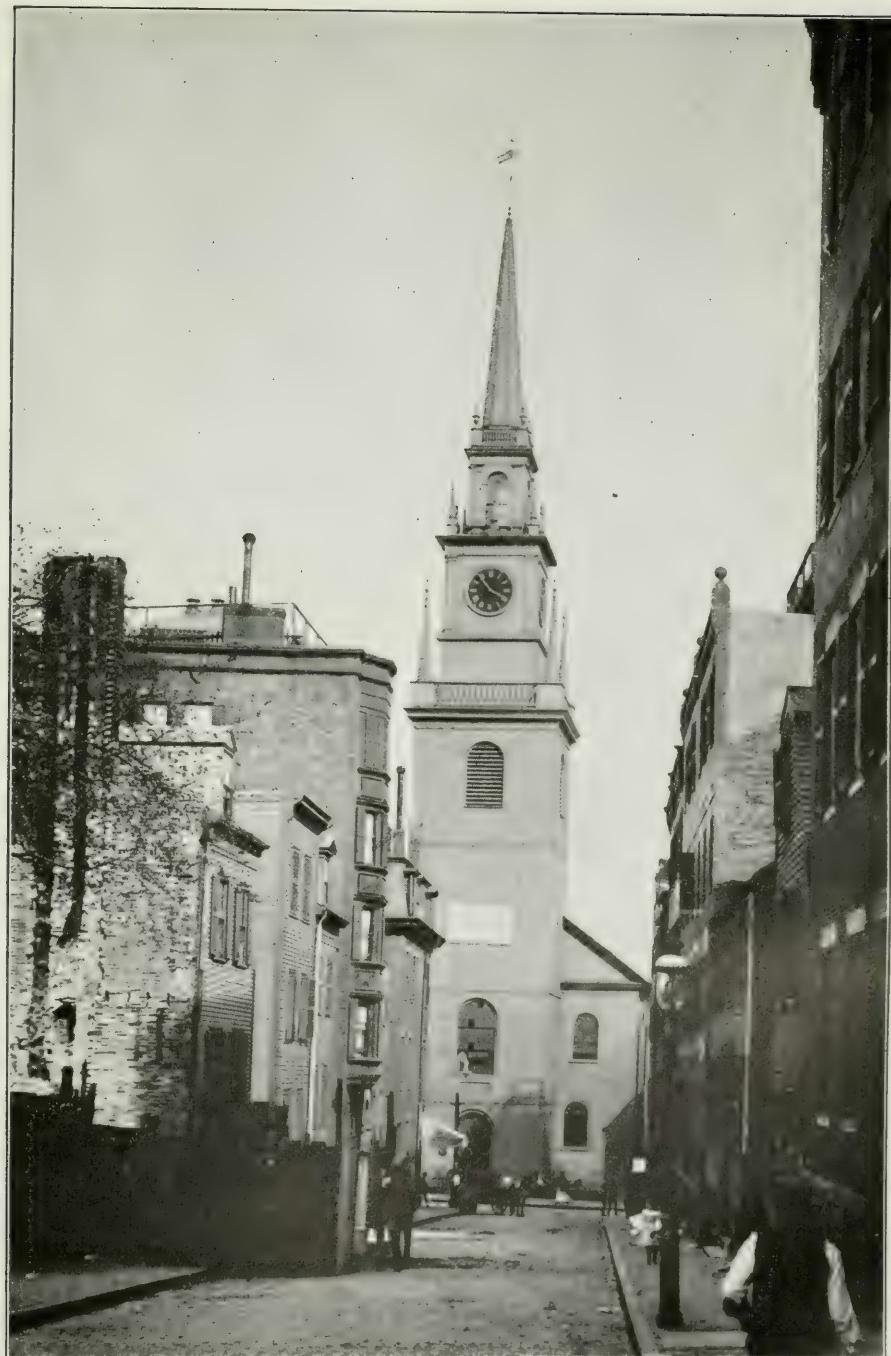
CHOSROES II., ascended the throne in 590, on the deposition of his father Hormidas, and is accused of having murdered him. His nobility conspired against him on account of his cruelties, and obliged him to flee to the Romans, who replaced him on the throne. He afterward carried his army into Judea, Syria, and Egypt, and made himself master of Carthage, but was defeated by the Emperor Heraclius, and thrown into prison by his son, where he died in 627.

CHOTA NAGPORE, or **CHUTIA NAGPUR**, a division of British India, presidency of Bengal, divided into the districts of Lohardaga, Hazaribagh, Singhbhum, and Manbhum; and nine feudatory states. Total area about 43,000 square miles. Pop. about 7,000,000.

CHOUTEAU, AUGUSTE, and **PIERRE**, two American pioneers; born in New Orleans, La., in 1739, and in 1749, respectively. They were from their early youth fur traders and in 1763 set out to establish trading stations in the regions W. of the Mississippi. On this trip they founded the city of St. Louis, in 1764. Auguste died in St. Louis, Feb. 24, 1829, and Pierre, July 9, 1849.

CHOWCHOW. See DOG.

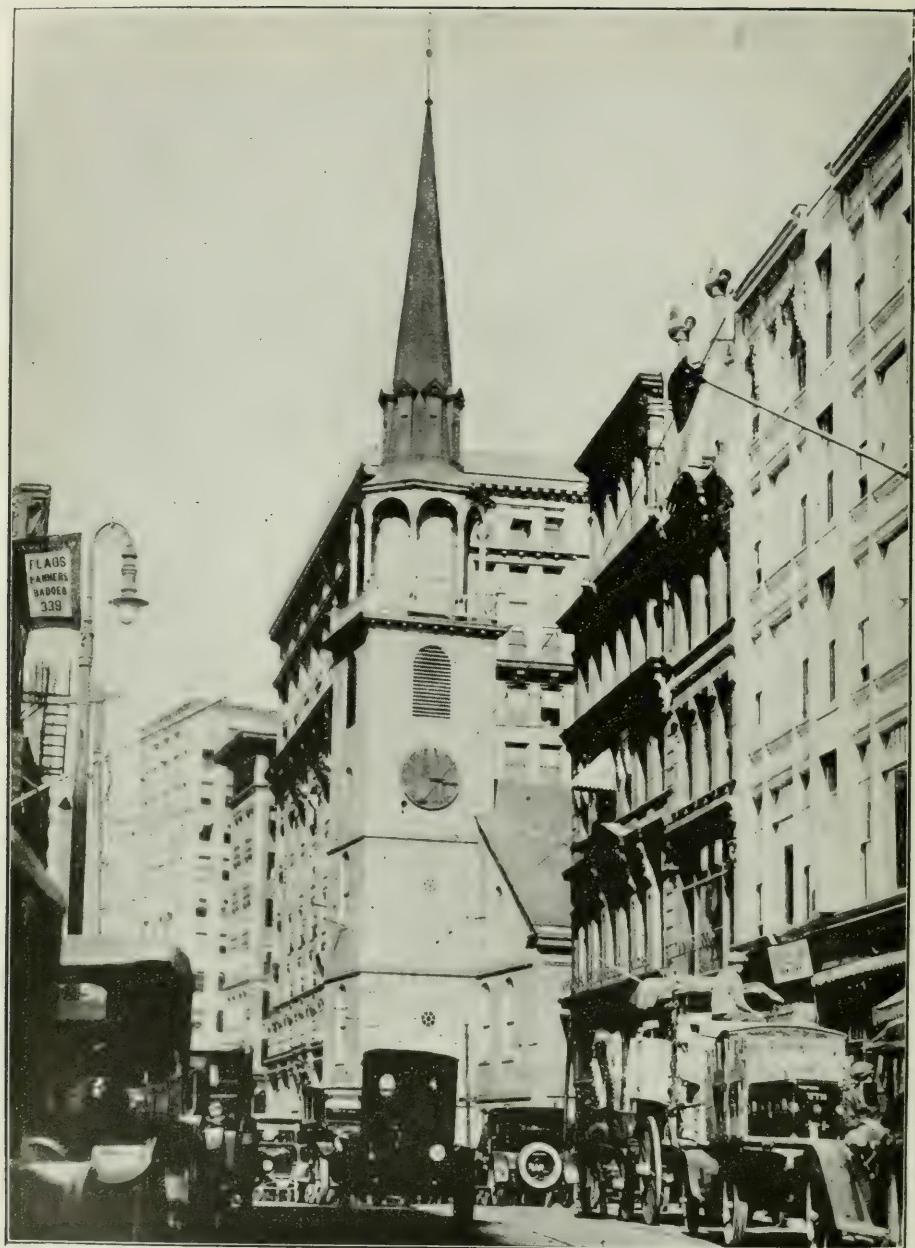
CHRESTIEN DE TROYES (*krest-yen de trwä*), the greatest of the early French romancers, flourished in the 12th century. Though he won high fame as a lyrist, his renown is based on his epic compositions, especially on his stories of King Arthur and the Round Table. His epic of "King Marcus and the Fair Ysault" is lost; but these remain: "Irec and Enid"; "Cligés"; "The Knight of La Charette"; "The Knight with the Lion"; "Perceval the Welshman." The last is his most considerable work, but it does not come from his hand alone, being continued and completed by Gautier de Denet and Menassier. In this piece are wrought into one story the legend of the Holy Grail and that of Arthur, which thereafter were not divorced. His language and the versification were models for troubadours and romancers for a long time; and from him the Arthurian poets to the end of the 13th cen-



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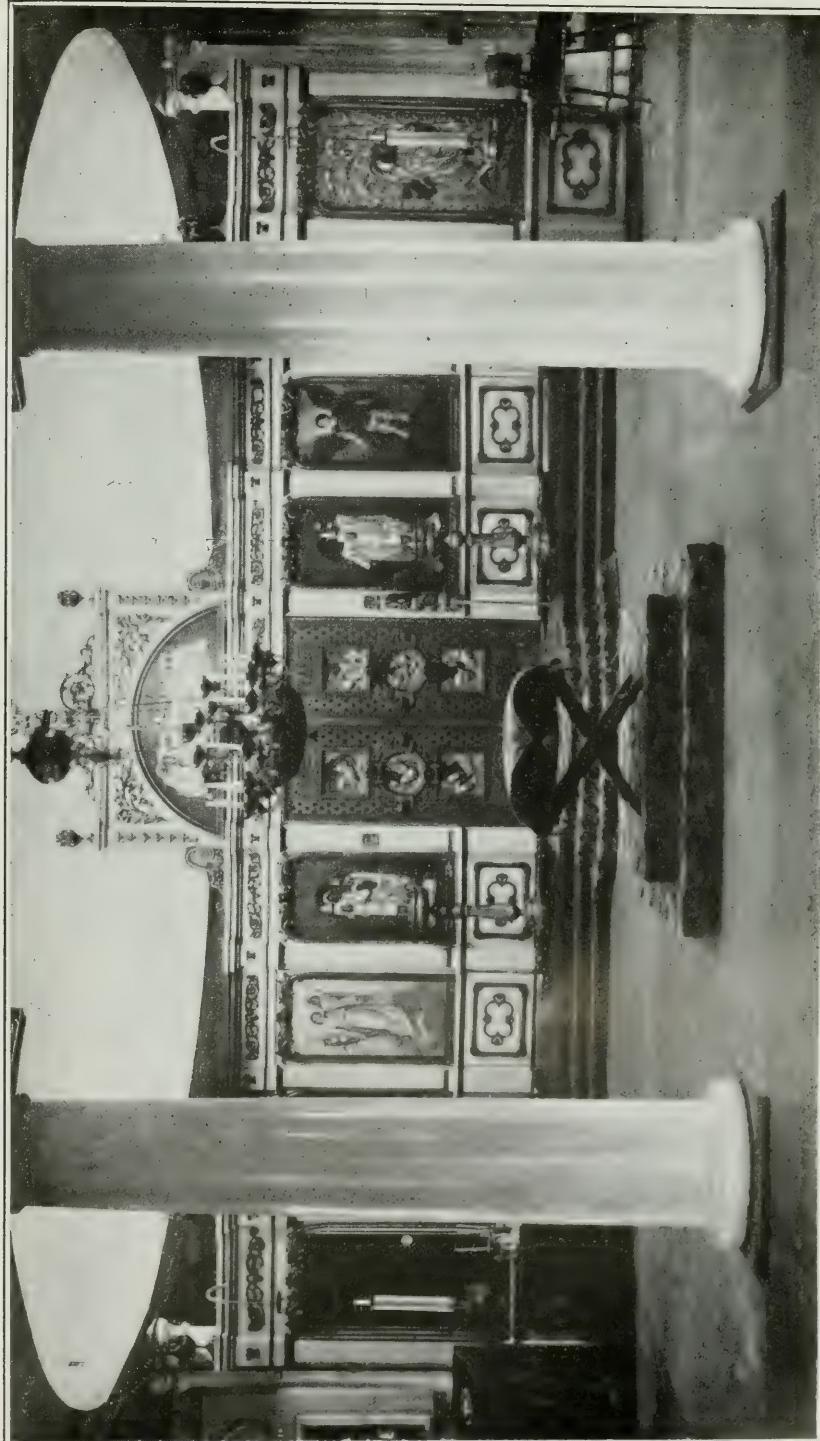


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CHRIST CHURCH, ALEXANDRIA, VA., WHERE WASHINGTON AND HIS FAMILY
WORSHIPPED

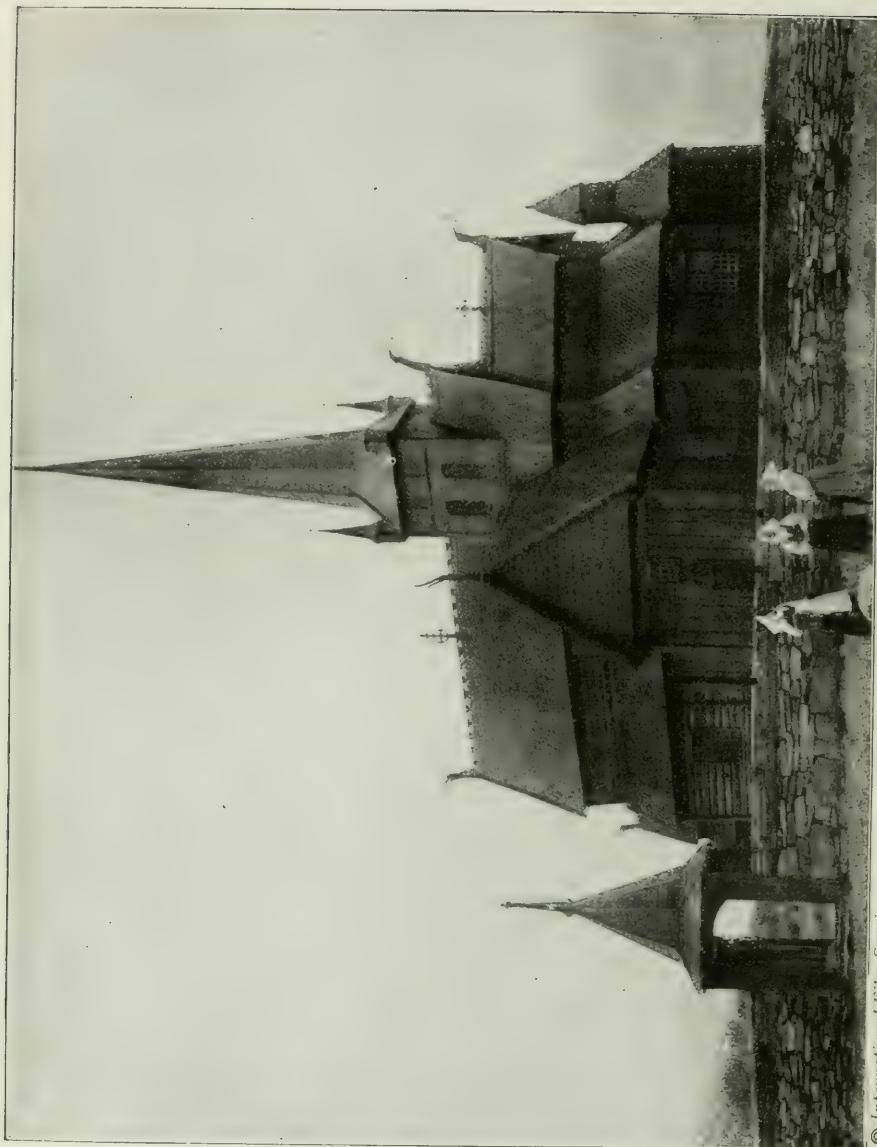


ST. JOHN'S CHURCH, RICHMOND, VA., AN OLD CHURCH ASSOCIATED WITH PATRICK HENRY



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AN OLD RUSSIAN CHURCH IN SITKA, ALASKA, WITH FINE PICTURES AND ORNAMENTS

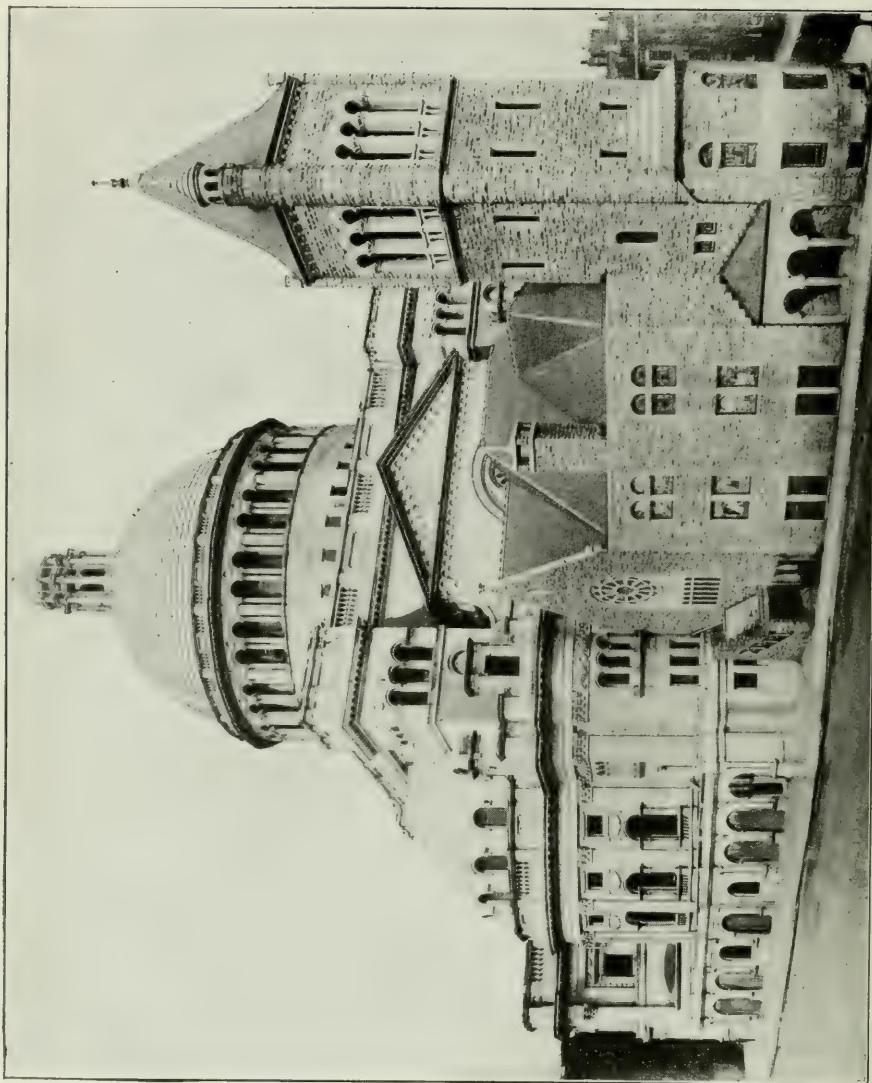


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AN OLD CHURCH IN NORWAY—A STAVE CHURCH WITH MANY OF THE TIMBERS UPRIGHT



A GREAT RUSSIAN CHURCH IN WARSZAW, POLAND

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tury borrowed episodes, themes, situations, characters, and all manner of poets' devices.

CHRIST, the name given as a title of eminence to Jesus our Saviour, whom, in the words of St. Peter (Acts x: 38), "God anointed," as king, priest, and prophet, "with the Holy Ghost and with power." The two names, Jesus Christ, are not analogous to a modern Christian name and surname; in reality the great Being so designated had but one personal appellation—Jesus: Christ being superadded at a later period to designate His office, function, or mission. It was borne by the military leader in the wars of Canaan (Josh. i.-xxiv., actually called Jesus in the authorized version of Acts vii: 45, and Heb. iv: 8), by Jesus surnamed Justus, a fellow-laborer with Paul (Col. iv: 11), and by about a dozen other persons figuring in the pages of Josephus; in fact the name seems to have been not uncommon among the Jews. We learn from St. Matthew that in this particular case the appellation was given previous to birth by Divine authority. ". . . thou shalt call his name Jesus, for he shall save his people from their sins." The year, the month, and the day when the child Jesus was born are matters of more or less uncertainty, not having been recorded with precision at the time. The salient features, however, of the life thus begun were narrated by four evangelists, who are believed by the majority of Christians to have written with infallible accuracy and trustworthiness under the guidance or inspiration of the Spirit of God.

The circumstances heralding or attendant upon the birth of John, afterward the Baptist, and the miraculous conception and nativity of Jesus, the last-named event at Bethlehem, are told at length by St. Luke (Luke i-ii); while St. Matthew relates the visit of the Magi, the slaughter of the infants at Bethlehem, and the flight of the holy family to Egypt (Matt. ii).

These occurrences took place while Augustus, the Roman emperor, was upon the throne (Luke ii: 1). Thirty years later, under the reign of Tiberius, John, now grown to full manhood, appeared in the wilderness of Judea, as an ascetic and preacher of repentance, the necessity of which he urged on the ground that the kingdom of heaven was at hand. Those who confessed their sins he baptized in the river Jordan, and thus a new religious community arose, separated to a certain extent from the ordinary professors of Judaism (Matt. iii: 1-10; Luke iii: 1-14).

Meanwhile Jesus, now about 30 years

of age, had come forth from the obscurity in which He had hitherto resided at Nazareth. (Luke ii: 51, iii: 23.) Having sought and obtained baptism from John, with Divine recognition as the Son of God, and having overcome temptation in the wilderness, He without further delay addressed Himself to His life-work in the world. (Matt. iii: 13-17, iv: 1-11; Luke iii: 21, 22, iv: 1-14.) He claimed to be the Messiah spoken of by holy men of old (Dan. ix: 25, 26, etc.), nay, more, to be, in one sense, the subordinate (John x: 29), and in another the equal of His Heavenly Father (v: 30). His ministry, while not ignoring repentance (Luke xiii: 3-5), was one chiefly of faith (John iii: 14-19) and love (John xiii: 34; Matt. v: 43-46). Twelve apostles (Matt. x: 1-6), and afterward 70 other disciples, were chosen to aid Him in His ministry (Luke x: 1, etc.), the former baptizing converts as they arose (John iv: 2).

The holy teacher continued His ministry, it is believed, for about three years in all, chiefly at Capernaum and other places near the Lake of Galilee (Matt. iv: 13; Luke vii: 1), as well as in other places of that province (Luke vii: 11, etc.; Matt. xvi: 13), in Perea beyond Jordan (Matt. xix: 1; Mark x: 1; Luke viii: 37), in Samaria (John iv: 1-42), beyond the Holy Land in Phoenicia (Mark vii: 24), and chiefly on occasions of great festivals, at Jerusalem, which necessitated His visiting other parts of Judea (Matt. xx: 29; John ii: 23, vii: 1, 2, 10). He supported His claims to be the Messiah by miracles of knowledge, *i. e.*, prophecies (Matt. xx: 19, etc.; Luke xix: 41-44) and miracles of power, such as healing the sick (Matt. ix: 35, etc.), nay, even raising the dead (Mark v: 22-43; Luke viii: 41-56; John xi: 1-44).

The chief priests and other dignitaries who held sway in the Jewish synagogues, were stirred up nearly to madness by jealousy of His success, and eagerly accepted the offer of an unworthy apostle, Judas Iscariot (*i. e.*, apparently of Kerioth in Judea) to betray his Lord. A manufactured charge of His blasphemy led to the condemnation of Jesus by His deadly foe, the high priest, but as the power of His life and death rested not with the Jewish authorities, but with the Roman governor, Pontius Pilate, a charge of disaffection to the imperial government was manufactured, as it was felt that the heathen Roman would not attach any weight to the alleged blasphemy. The procurator had discernment to see clearly that what he was required to do was to sanction a judicial murder, and for some time re-

fused to become partner in the Jewish ruler's guilt. But as the cry, "Crucify him," "crucify him," continued to rise from the multitude, he resolved to avoid unpopularity at the expense of moral principle, and gave sentence that it should be as the Jews required. The crucifixion therefore took place (Matt. xxvii; Mark xv; Luke xxiii; John xix). Friday was the day when the nefarious deed was done, and three days later, or early on Sunday morning, news was brought to the Apostles, and the Church generally by certain women of their company who had visited the sepulcher, that a resurrection had taken place (Matt. xxviii; Mark xvi; Luke xxiv; John xx, xxi). At a subsequent interview with their risen Lord He gave the Apostles and their successors a commission to make disciples of all nations, baptizing them in the name of the Father, and of the Son, and of the Holy Ghost (Matt. xxviii, 19, etc.); and about 40 days after the crucifixion He led them out as far as Bethany and lifted up His hands and blessed them. "And it came to pass, while He blessed them, He was parted from them, and carried up into heaven" (Luke xxiv: 50, 51). He had predicted His cruel death, His resurrection on the third day (Matt. xx: 19), and His ascension (John xx: 17), and had intimated that at a future period He would again return to the earth in glory (Matt. xxvi: 64, etc.).

CHRIST, DISCIPLES OF. See DISCIPLES OF CHRIST.

CHRIST, ORDER OF, on the abolition of the Templars by Clement V., in 1312, King Dionysius of Portugal preserved the order in his dominions, but changed its title to that of The Knights of Christ, or The Order of Our Lord Jesus Christ. This arrangement was sanctioned by Pope John XXII., in 1319. The seat of the order was transferred from Castro-Marino to Thomar in 1366. The new order afterward attained such power that King John III. was obliged to obtain an edict from Pope Hadrian VI., 1522, by which the grandmastership of the order became vested in the kings of Portugal.

CHRISTADELPHIANS, a religious body who believe that God will raise all who love Him to an endless life in this world, but that those who do not shall absolutely perish in death; that Christ is the Son of God, inheriting moral perfection from the Deity, our human nature from His mother; and that there is no personal devil. In the United States they had about 70 organizations with about 2,000 members. Their founder

was Dr. John Thomas, an Englishman, who came to the United States in 1844.

CHRISTCHURCH, a city of South Island, New Zealand, the capital of the province of Canterbury. It is on the river Avon, and is connected with Lyttelton, its seaport, by railway. It is the center of an important agricultural and grazing district and has manufactures of boats, clothing, furniture, and agricultural implements. There is also a large export trade in mutton, wool, and timber. The city has many fine buildings, including churches, a museum, a theater, and an opera house. It is the seat of Christ College and of the bishopric of Canterbury. Pop. about 95,000.

CHRIST CHURCH, COLLEGE OF, a notable institution in Oxford, England. In 1526 Wolsey obtained from Clement VII. a bull for the suppression of 22 monasteries, the site of one of which he chose for a new college, to be called Cardinal College, and which he intended to endow beyond that of any other in Oxford. On the fall of Wolsey, in 1529, the establishment came into the hands of King Henry VIII. In 1532 that prince founded it under the name of King Henry VIII.'s College, and in 1546 he once more re-established the college under the name of "Christ Church Cathedral in Oxford, or the Foundation of King Henry VIII., with a dean and 8 canons, 60 students, 40 schoolboys, clerks, choristers," etc. This foundation is now subsisting, though it has undergone considerable modifications. It is one of the most famous colleges of Oxford University and counts among its former members many of the most illustrious names in English history.

CHRISTENSEN, PARLEY PARKER, an American politician; born in Weston, Ida., July 19, 1869. He was educated in the public schools of Utah and was graduated from the State university in 1891. He took a further course at Cornell University, receiving from that institution the degree of LL. B. in 1897. In September of that year he was admitted to the bar of Utah and in 1905 to the United States Supreme Court. In 1895 he was the district attorney of Salt Lake co., Utah. He was a member of the House in the Utah State Legislature in 1915. He was nominated for president of the United States by the FARMER-LABOR PARTY (*q. v.*), July 15, 1920.

CHRISTIAN, one who believes or professes the religion of Christ; a follower of Christ.

CHRISTIAN I., King of Denmark and Norway from 1448 to 1481.

CHRISTIAN II., the Cruel, succeeded his father, John, in 1513. His cruelties and exactions caused his name to be universally execrated. The nation rallied round Gustavus Vasa, and Christian was compelled to sign his own abdication, 1523. He began wandering over Europe in the hope of enlisting partisans in his cause, but was at last taken prisoner, and thrown into confinement, where he died in 1559.

CHRISTIAN III., succeeded his father, Frederick I., and died in 1559.

CHRISTIAN IV., succeeded his father, Frederick II., in 1588; spent his life in the German wars, and died in 1648.

CHRISTIAN V., succeeded Frederick III. in 1670, and died in 1699, after a long and fruitless war against Sweden.

CHRISTIAN VI., succeeded his father, Frederick IV., 1730, and died in 1746.

CHRISTIAN VII., succeeded his father, Frederick V., in 1766, and in the same year married Caroline Matilda, sister of George III. of England. The dissipations of his early life had enfeebled his energies and rendered him unfit for government. The management of the state was, in consequence, seized first by Count Bernstorff and later by Struensee. In 1784, Christian being incapacitated by mental disease, his son, Frederick VI., came to the head of the government, as joint regent with the queen-mother. Christian died in 1808.

CHRISTIAN VIII., Duke of Schleswig-Holstein and Lauenburg, succeeded Frederick VI. in 1839, as King of Denmark only, and died in 1848.

CHRISTIAN IX., (of Schleswig-Holstein-Sonderburg-Glücksburg); born in 1818, succeeded Frederick VII. as King of Denmark, in 1863. His second son, George, was, in 1863, elected King of Greece, and of his daughters Alexandra married the Prince of Wales, later King Edward VII. of England, and Dagmar the Czarewitch of Russia, later Czar Alexander III. He died Jan. 29, 1906.

CHRISTIAN X., King of Denmark, born at Charlottenlund, Denmark, in 1870, the son of King Frederick VIII. He succeeded his father to the throne of Denmark on the death of the latter in May 14, 1912. In 1898 he married Alexandrine, Duchess of Mecklenburg. He had two sons, Frederick, the Crown Prince, born in 1899; and Knud, born in 1900.

CHRISTIAN BROTHERS' COLLEGE, a Roman Catholic institution for higher education in St. Louis, Mo., chartered in

1855. It includes collegiate, scientific, commercial, and preparatory departments. The library contains about 20,000 volumes. The annual enrollment is about 500.

CHRISTIAN CATHOLIC CHURCH, a denominational organization, founded in 1896 by the Rev. John Alexander Dowie, a former Congregational minister in Australia. He attracted a large following by preaching faith healing and announcing himself as the reincarnation of the prophet Elijah. He established the center of activities in Zion City, near Chicago, where a large amount of property was acquired and many institutions and business enterprises were founded. Dowie was successful in securing a large number of believers, until 1903, when he attempted to carry on a missionary campaign in New York. This was a failure and the ridicule which followed it led finally to his deposition and death. He was succeeded by W. G. Voliva as Overseer of the Church. The religious aspect of the organization decreased, while its industrial development at Zion City continued. Difficulties arose, however, which resulted in financial complications and in 1910 the enterprises of Zion City were sold at auction. The denomination has branches in Australia, New Zealand, China, Japan, and in various parts of Europe.

CHRISTIAN CHURCH, THE, consists of those who have been baptized in the name of Christ and who accept his doctrines and live in harmony with them. The Church, in its broadest sense, consists of true believers in all ages; but the Christian Church was established through the life and work of Christ himself, and consists only of his followers. Its first great increase was at Pentecost, where 3,000 souls were converted; shortly afterward 5,000 were added to the Church. Stephen was the first to suffer martyrdom. Paul made three great missionary tours, and the result was the organic unity of the Church in its first period.

Ancient Period, A. D. 30-750.—The first part of this period was distinguished by great simplicity of doctrine and life, and zeal in extending the kingdom of Christ. Important centers were established, and the Gospel was largely confined to the middle and lower classes. Controversies arose between the Gentile and Jewish Christians, but not to such an extent as to arrest steady progress. This was the time of great persecutions. There were ten in all, the most serious being under the Emperors Nero, Maximinus, Decius, and Diocletian. The Scriptures were collected into a canon,

and the Church made great advance in numbers and territory. The Council of Nice (A. D. 325) was a great triumph for orthodoxy. It declared the essential Trinity of the Godhead, and settled for all time the divinity of Christ as a fundamental doctrine of Christian faith. The heresy of Arius was condemned, persecution ceased, through the sympathy of the Emperor Constantine, who, in 313, removed all disabilities from Christians, and in 323 made Christianity the state religion of the Roman Empire. Monasticism, a reaction against worldliness, increased rapidly. Leo the Great, Bishop of Rome, extended the authority of the Western Church in opposition to the claims of the patriarch of Constantinople. Mohammedanism paralyzed the Eastern Church for a time in the 7th and 8th centuries. Mohammedanism was arrested in western Europe by Charles Martel, by the victory of Tours, in 732. Gregory the Great, Bishop of Rome, ruled from 590 to 604. He magnified the Romish pretensions, organized monkish orders, elaborated the church festivals, and established purgatory as a Roman Catholic doctrine. He organized a mission among the Anglo-Saxons. The Gospel spread rapidly through Britain and Germany. Christian art was patronized liberally by the Roman bishops. The close of the ancient period found the Latin or Western Church very vigorous and aggressive, but the Eastern Church in a stagnant condition.

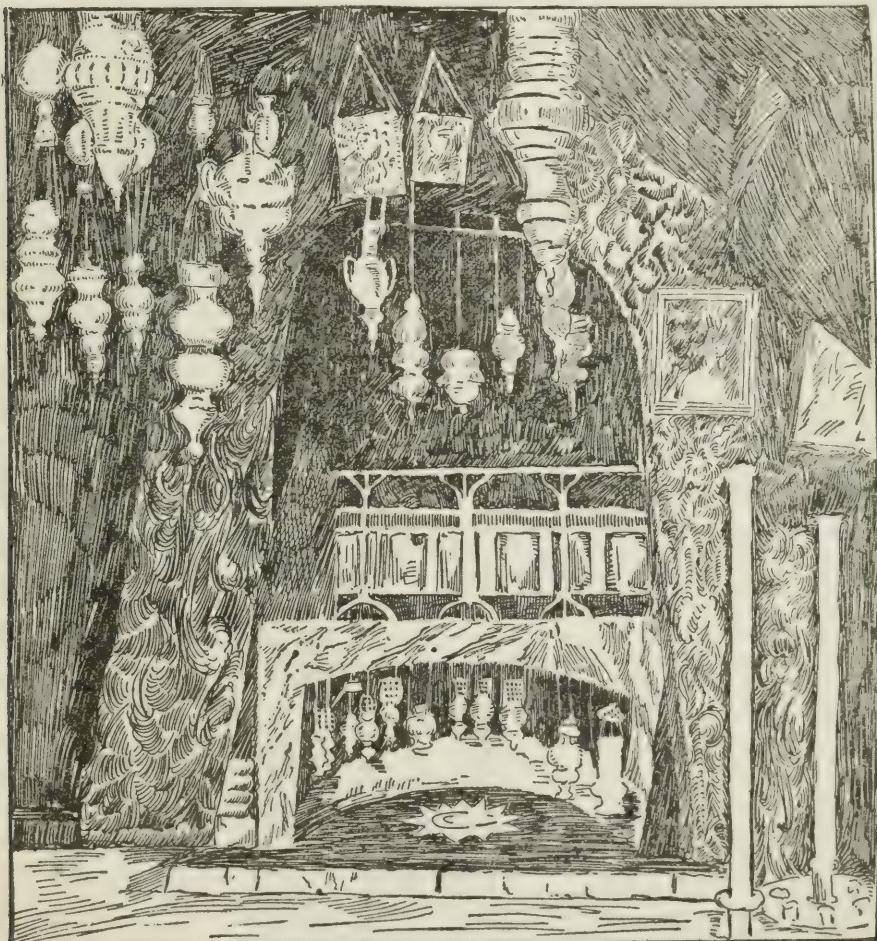
Mediæval Period, A. D. 750-1517.—This period falls into three great divisions: From Charlemagne to Gregory VII. (750-1073); from Gregory VII. to removal of Papal See to France (1073-1305); from removal of Papal See to Reformation (1305-1517). The Middle Ages were the transition from the ancient to the modern period. The most important political events, all of which had a bearing on the Church, were the end of the Greek exarchate in Italy; the destruction of the Lombard kingdom, the organization of the Frank Empire under Pepin, rise of the new Germanic Church, division of the Mohammedan caliphate, decline of the Greek Empire, and development of the new Roman Empire in the west. Charlemagne was the greatest mediæval ruler. He was victorious over many northern tribes, and increased the territory of the Church to vast proportions. He was a liberal patron of learning, and authorized a Latin version of the Scriptures. Alfred the Great of England reigned from 871 to 901, and was as distinguished for learning as for his power to rule. The Russian monarchy was founded by Ruric in the middle of the 9th century. At this time the evan-

gelization of heathen nations progressed rapidly. The Hungarians, Bulgarians, Bohemians, Moravians, Wends, and Scandinavians accepted Christianity. Corruption increased rapidly in the Roman Church; the papacy was at the service of the highest bidder; and indulgences and transubstantiation were cardinal forces in the new Romanism. The violent rule of the Mohammedans over Palestine excited the wrath of western Europe, and crusades were organized for the rescue of the country from the Moslems. There were seven crusades, extending from 1096 to 1272. Christian Europe failed, finally, to hold the country, but the general effect of the crusades was beneficial in the development of commerce, introduction of Oriental thought, and the growth of popular liberty. Reformatory movements were inaugurated through the Waldenses (1170); Wyclif (1324); John Huss (1373); the Moravian Brethren (1417); the Mystics (Tauler, Suso, Ruysbroek, Groot, Thomas à Kempis) and Savonarola (1480-1497). Mendicant orders were established. The Inquisition, established to arrest reform, was decreed in 1215.

The Modern Period, 1517 to the Present.—The Church was in a corrupt and superstitious condition. All the attempts at reform had been unsuccessful. Martin Luther, born 1483, began the Geneva reformation by publishing 95 theses against Rome. He translated the scriptures into German, gained the co-operation of the German princes, and published sermons and other works against the errors of Romanism. Melanchthon was the chief doctrinal writer of the Reformation. Erasmus labored in the department of New Testament criticism. The leading Swiss Reformers were Zwingli in eastern Switzerland, and the learned and pure Calvin in western. Farel stood next to Calvin in Geneva. The English Reformation had King Henry VIII. on its side, through no pious motives, but because the Pope would not sanction his frequent marriages. This was the great opportunity for which the Reformers of England had been waiting. Protestant sentiment grew rapidly, but in the next reign Ridley, Latimer, Cranmer, Hooper, Taylor fell victims to Queen Mary's Romanism. Under Elizabeth the Reformation was placed on a firm foundation. The Puritans were a reaction against Romanism and sympathy with it in the Church of England. Arminius, born 1560, in Holland, opposed the chief tenets of Calvinism. The Synod of Dort resulted in the political triumph of the Calvinists, and the expulsion of the Remonstrants, until the death of Maurice (1630). The Thirty Years' War (1618-1648) was confined to the Continent, and

established the territorial boundaries of the Protestant and Catholic nations. The Huguenots of France were persecuted 1572, and 70,000 people were killed on St. Bartholomew's night. The Jesuits, organized by Ignatius Loyola, 1540, were established as an offset to the aggression of Protestantism. Deism prevailed to an alarming extent in England, its chief promoters being Hobbes, Herbert, Shaftesbury, Tindal, Bolingbroke, Hume, and Gibbon. They had strong antagonists

Rationalism arose in 1750, through the teachings of Wolfe, Semler, and the example of the Prussian court. It declined in the 19th century, through the labors of Tholuck, Neander, Hengstenberg, Ullmann, and others. The Evangelical Alliance (1846) promoted the unity of orthodox Christians in all parts of the world, and, to a corresponding degree, the victory over skepticism. The Old Catholics, a Roman Catholic reaction against the Vatican Council of 1869, were organized



CHURCH OF THE NATIVITY, BETHLEHEM

(Baxter, Cudworth, Taylor, Wateland, Leland, Butler, Paley), but the general condition of the people was irreligious. Methodism, which arose from John Wesley, born 1703, was a fervent religious movement. Charles Wesley, Whitefield, John Fletcher, Joseph Benson, and Adam Clarke were strong coadjutors. German

into a Church in 1870; Döllinger, Huber, and Friedrich were at their head.

The American Church.—The colonization of North America sprang from religious motives. The colonists sought freedom here because of the oppressions at home. Periods of American Church History: (1) From 1607-1660, revival and

progress. (2) 1660-1720, trial, disputes with Great Britain, religious decline. (3) From 1720-1750, great revivals. (4) From 1750-1783, political agitation, freedom from British rule. (5) From 1783 to the present, extensive revivals, separation of Church and State, abolition of slavery, evangelization. The Protestant Episcopal Church was founded by the James River Colony (1607); its first General Convention was in 1785; it ratified the Thirty-nine Articles in 1832. The Puritan Pilgrims landed at Plymouth in 1620, and began the development of Congregationalism. The Cambridge Platform was established in 1648. The Reformed (Dutch) Church was established in 1628 in New Amsterdam (New York). The first independent organization was in 1771. The Baptists began in Providence, R. I., in 1639, through Roger Williams. The Reformed (German) Church was organized in 1741. The Lutherans were established first in New York in 1669; the first Synod was held in 1748. The Presbyterians were organized at the close of the 17th century. The first Presbytery was established in Philadelphia in 1706, and the first General Assembly in 1789. The first Methodist Society in the United States was established in New York in 1766, and the first Conference was held in Philadelphia in 1771. The Reformed Episcopal Church was organized in New York in 1873, under Bishop Cummins. The Roman Catholic Church in the United States was first established in Maryland through immigration in 1632. The Episcopal See of Baltimore was established in 1789. For statistics of the American Churches see the separate articles.

CHRISTIAN ENDEAVOR, YOUNG PEOPLE'S SOCIETY OF, a society distinctly religious in all its features: organized Feb. 2, 1881, in Williston Church, Portland, Me., by the Rev. Francis E. Clark, D. D. From one small association it has expanded into over 77,500 societies (United States, 51,268; Canada, 4,118; foreign countries 22,181), with an aggregate membership of over 5,000,000. In addition to the main organizations in the United States there are various special branches, such as the Life Savers', instituted by the Rev. S. Edward Young, at the United States Life-Saving Station at Asbury Park, N. J.; the Travelers' Christian Endeavor Union, organized at Philadelphia, Nov. 14, 1892, for work among commercial travelers; the Floating societies for work in the United States navy and among seamen generally; and various other organizations whose fields of labor lie among the Chinese, the Indians, convicts in prison, etc.

The first Christian Endeavor Society in England was organized in 1887, and was followed by similar ones in other countries, and the constitution has been printed in over 30 different languages. The movement is not a denominational one. Any society belonging to an evangelical Church, which adopts the leading principles as set forth in the constitution, including the prayer-meeting pledge, and which guarantees these principles by the name Christian Endeavor either alone or in connection with a denominational name is admitted to all the privileges of the organization.

The distinctive features in the Christian Endeavor movement are its work among the young people, leading them to consecrate their lives to the active service of God; the weekly prayer-meetings, which each member takes a solemn pledge to attend regularly (unless unavoidably detained), and to take part in; and the reconsecration meetings held once a month, at which special efforts are made to see if each one has been faithful to his pledges. The World's Union of Christian Endeavor held its first triennial convention at Washington, D. C., in July, 1896, which was attended by representatives from all over the world. Since then several international conferences have been held, the last at Buffalo, N. Y., in August, 1919. The United Society of Christian Endeavor is a central body formed in 1885, with headquarters in Boston. It publishes the "Christian Endeavor World." The president of the religious society in 1919 was Rev. Francis E. Clark, and the general secretary, William Shaw.

CHRISTIAN ERA, the era or epoch introduced by the birth of Christ.

CHRISTIANIA, a city and port, the capital of Norway, at the head of the long narrow inlet called Christiania Fjord, about 60 miles from the open sea or Skagerrack. The houses are mostly of brick and stone, generally plain buildings, devoid of architectural pretension. Important public buildings are the royal palace, the house of representatives, or Storthing, the governor's palace, and the cathedral. An interesting building is the fine old castle of Aggershus, with its church and citadel crowning a point jutting out into the fjord. Attached to the university—the only one in Norway, opened in 1813—is a museum, containing a fine collection of antiquities and a library with over 500,000 volumes. The manufactures of the city consist of woollen cloth, ironware, tobacco, paper, leather, soap, spirits, glass, etc., and there are extensive breweries. The exports are principally timber and iron.

It has a very spacious harbor, regular steamship connection with many foreign countries, including the United States, and handles about one-half the imports and about one-third the exports to and from Norway. The environs are exceedingly beautiful. Pop. (1918) 259,445.

CHRISTIANITY, the religion of which Jesus Christ is not only the founder, but also the object, since it is by Him and in Him that man recovers his union with God by an effective reconciliation. This may be said to be in a general manner its true character, and to mark the difference that exists between it and all the religions which preceded it. About primitive Christianity we possess a number of documents which are at least authentic, whatever the authority we attribute to them from a doctrinal point of view. Confining ourselves to those documents alone, whose authenticity is not disallowed by the most negative criticism, we have in the epistles of Paul to the Corinthians, the Galatians, the Romans, and the Thessalonians, a testimony to primitive Christianity which falls between the year 55 and the year 64 after Jesus Christ. It emanates from an apostle who had been in direct contact with the earliest associates of Christ, with those who had both seen and heard Him. The first three gospels, in which a historical basis is generally recognized in what concerns the actions as well as the discourses of Jesus, point back to the same date. We are thus led back to the very origin of Christianity. Moreover, we recognize in the Church of the earliest period made known to us, whether in the Acts of the Apostles or in writings as authentic as the letters of James and those of Peter, the living impress upon simple and honest hearts of the direct remembrance of Christ. It is undeniable that if Christianity claims to carry to the world a revealed doctrine, revealing completely the true nature of God as well as that of man, and the normal relations of union between them, it attaches that doctrine to a personality considered not only as the organ of the revelation, but as its object. We have thus the right to assert that Christianity is Jesus Christ, without fearing to detract anything from the attributes of God, for Jesus Christ is His ambassador, His son, the sole mediator between God and man—in one word, the Redeemer, the Saviour, as His name implies. He has never ceased to require faith in Himself as the means of again finding God by Him. Fragmentary quotations on this point are vain. The whole gospel demands this faith in His person, and St. Paul sums it up in the words addressed to the gaoler

at Philippi: "Believe on the Lord Jesus Christ, and thou shalt be saved." (Acts xvi: 31.)

Christianity is herein distinguished from all other religions. The revelation which it brings to the world is something other than a supernatural communication of a transcendent doctrine about God, and about our origin and purpose in the world. It consists essentially in a great work accomplished by a single person—a work which is the supreme manifestation of the holy love of God. The mere exhibition of this divine work casts a bright light upon God as well as upon man and results in a doctrine which implies a complete metaphysic, a complete anthropology, and an entire system of ethics, as well as far-reaching views on the history of the human race in its terrestrial development and in its future destiny. For had it been otherwise, Christianity must have contented itself with communicating to us the outward fact without explaining it—without making us grasp it by its inward side in its profound significance; which would have been to alter its nature completely. It none the less remains true that for Christianity doctrine is only a secondary and complementary element—the interpretation of the fact of the great work, which is its first object. This is why it addresses itself before everything to the heart and to the conscience, though at the same time it opens up to the intellect the vastest possible horizons.

Christianity is pre-eminently the religion of redemption and of the redeemer. It has introduced to the world the grand reparative influence of a victorious love, inaugurating in Jesus Himself an unceasing struggle; for that reparative influence must struggle constantly against the powers of evil, which are not magically suppressed. But this reparative work cannot consist alone in the salvation of individual souls; to be worthy of God it must strive to restore all that the original fall has blighted or destroyed—to make the fallen creature realize all his lofty destiny—that is to say, to reconstitute in man all the greatness kept in store for him, and to give him up without reserve to God, making the regenerating spirit penetrate into every sphere of his activity as into all his faculties. Hence the wide mission of Christianity to purify and raise everything that is human in the most diverse spheres of society, from the institutions which regulate the relations of men to each other to the highest culture of the intellect. This restoration of man after the divine type is the continuation and application of the redemptive work of Christ, which, after having had for its

first intent to form in the Church a society of believing souls, pardoned and saved, called to work directly for the salvation of all that is lost, next radiates outward into all the departments of human activity. It is in this enlarged sense that we must understand the kingdom of God which the Saviour came to found in our sinful world, and of which the progress goes on only at the price of an incessant struggle, which will continue to the end of time. But this general advance of the kingdom of God in its widely human extension is always proportionate to its internal development within His Church, which keeps and cherishes the central hearth of the divine life, whence emanate all light and heat.

We know in a general manner what the vast influence of Christianity has been in the world for 19 centuries. It has renewed society in the very depths of universal decline without ever neglecting its first task, which is to lead the souls of sinners to Christ. Spiritual conquests count upon no more than this. But these victorious struggles have not been pursued without many dangers, no little resistance and as much dark uncertainty, which have sometimes had the effect of altering Christianity for a time, at least in its historical realizations, for its high ideal has never ceased to soar with serene radiance in the eternal gospel. It may be put under a bushel, but it has never been possible to extinguish it or to change its form. It is this inherent recuperative power that admits of the renewal and elevation again of Christianity, however much it may have been debased. See CHRISTIAN CHURCH, THE.

CHRISTIAN REFORMED CHURCH, a religious denomination in the United States, the result of the secession movement from the Reformed Church in 1822, in 1857, and again in 1882. There are about 40,000 communicants, chiefly in Michigan, Illinois, and Iowa. The denomination maintains the Calvin College Theological Seminary at Grand Rapids, Mich.

CHRISTIANS, or CHRISTIAN CHURCH, a denomination which had its origin near the close of the 18th century in Virginia and North Carolina, when three bodies withdrew from the Methodist Episcopal Church. They were first known as Republican Methodists, but in 1795 decided to be known only as The Christian Church. In 1819 the three bodies united to form one denomination. It grew rapidly and perfected organizations for the carrying on of publishing, educational, and missionary work. These interests are now represented by the American Christian Convention, com-

posed of members of local conferences from the United States and Canada, and of the presidents of colleges and state and district organizations. The convention meets every four years. Missionary work is carried on in the United States, Canada, Japan, Porto Rico, and other countries. Educational institutions carried on by the denomination include the Christian Biblical Institute, Defiance, O.; Starkey Seminary, Lakemont, N. Y.; Union Christian College, Merom, Ind.; Elon College, Elon College, N. C.; Palmer College, Albany, Mo.; Defiance College, Defiance, O., and the Franklin College (colored), Franklinton, N. C. The denomination issues many publications. In 1919 there were 117,853 communicants, 1,274 ministers, and 1,213 churches.

CHRISTIANSAND, a seaport of Norway, situated near its S. extremity, on a sandy plain. It is a garrisoned town; was built by Christian IV. in 1641; and has been the capital of its province or stift since 1684. It has several dock-yards, and a good harbor much used for refuge. At the mouth of the harbor is the beautiful island of Odderö, laid out with public gardens and promenades. Christiansand has a considerable trade in timber, pitch, stockfish (salted cod), fish-oil for curriers, salmon, mackerel, and lobsters. Shipbuilding is a considerable industry. Christiansand has a cathedral and grammar-school, and is the residence of a bishop. It suffered severely from fires in 1880 and 1892. Pop. about 18,000.

CHRISTIAN SCIENCE, a religious belief of which Mrs. Mary Baker Eddy, of Boston, was the founder and chief apostle. Her disciples believe in God, in the Saviour, and in the Scriptures, and devote most of their efforts to healing the sick. They claim that matter is non-existent and that, as God is spirit, and man, being made in His image, is, therefore, also spiritual and cannot suffer, disease is not actual, but a wrong belief, and can be cured by discarding such belief. Since the promulgation of this doctrine in 1875, its growth has been steady in the United States and its followers have large churches in various parts of the country. Flourishing churches have been organized in many other parts of the world. Many handsome church edifices have been built in different cities: The mother church is located in Boston, Mass., and those all over the country are its branches. The services are uniform, consisting of meetings on Sundays and on Wednesday evenings. No sermons are preached by a personal pastor, but a sermon made up of selections from the

Bible and "Science and Health, with a Key to the Scriptures," written by Mrs. Eddy, is read by two readers, called the first and second readers. This Church is emphatically a healing Church and many cases of restoration to health have been testified to, brought about by attendance at these meetings.

Christian Science, its adherents claim, is demonstrable Christianity. Through the spiritual understanding of the teachings of Christ Jesus, its followers are enabled to obey His command to "heal the sick," and do the works that He and His disciples did. The omnipotence, omnipresence, and omniscience of God are proved to be true. Christian Science is not mind-cure, as that is popularly understood, because it recognizes but one mind, God. It is not faith-cure, because it does not perform its wonderful works through blind faith in a personal God, but through the understanding of man's relation to God. It is not mesmerism or hypnotism, because it denies absolutely the power of the human mind and human will, and claims no will but God's. Through recognizing the one mind, and man as the reflection of that mind, it forever establishes the brotherhood of man. It is the perfect salvation from the sin, disease, and death, Christ Jesus came to bring. In "Rudimental Divine Science," Mrs. Eddy defined Christian Science as "the law of God, the law of good, interpreting and demonstrating the principle and rule of eternal harmony." In 1919 the number of churches and societies in this and foreign countries was given as 1,741.

CHRISTIANSÖ (-ou'ë), a group of three small islands in the Baltic, belonging to Denmark, named from the chief island, which has a harbor of refuge and a lighthouse.

CHRISTIANS OF ST. THOMAS, the name of a sect of Christians on the coast of Malabar, in India, to which region the apostle St. Thomas is said to have carried the gospel. They belong to those Christians who, in the year 499, united to form a Syrian and Chaldaic Church in central and eastern Asia, and are, like them, Nestorians.

CHRISTIANSTAD, a city of Sweden, the capital of the province of the same name. It is on the Helge river. Its chief industries are the manufacture of woolen goods, tobacco, iron, and gloves. It has a considerable trade by river. The city has an arsenal, a church, a museum, and other notable public buildings. Pop. about 15,000.

CHRISTIANSUND, a Norwegian coast-town, built on three wooded is-

lands, Kirkelandsö, Inlandsö, and Nordlandsö. It has a considerable trade in salt-fish. The chief public buildings are the grammar school and custom house. Pop. about 15,000.

CHRISTIAN UNION CHURCHES, an American denominational union, organized in 1865, composed of members of all varieties of orthodox belief. Their creed is simple, covering the headship of Christ, sufficiency of the Bible, and right of local church government.

CHRISTINA, Queen of Sweden; born in 1626. She was the daughter of the great Gustavus Adolphus, and on her father's death, in 1632, was crowned queen, being then only six years of age, with the five principal ministers of state appointed by Parliament her guardians. Christina was educated under the eye of the celebrated Swedish chancellor Oxenstiern, and early showed great avidity for learning, as well as a considerable share of moral eccentricity. She was fond of wearing men's apparel, and of following masculine habits and pursuits; hence she acquired quite an Amazonian reputation. On the termination of her minority, in 1644, she entered upon administrative business with a zeal and an ability which astonished her people. She put an end to the war with Denmark, begun that year; and in 1645, by the treaty of Brömsebro, obtained some new provinces. She next turned her attention to the promotion of the interests of commerce, education, and learning. She was herself, perhaps, the most accomplished woman of that age, understanding no fewer than six languages, and maintaining an auto-graph correspondence with the most learned men of foreign nations. She studied chemistry, astronomy, and even alchemy and astrology, with the most celebrated professors. Having, in 1649, settled the regal succession in favor of her cousin, Prince Carl Gustav of Pfalz-Zweibrücken, she for some time conducted her government in a manner that promised the surmounting of the temporary difficulties of the realm; but, having resolved to abandon Protestantism, she, in 1654, in an assembly of the states at Upsala, abdicated her crown, reserving to herself an annual income of \$200,000. In 1656 she went to France, where she lived principally at Fontainebleau, Compiègne, and Paris. During the year following, she excited universal horror and disgust by the assassination of her master of the horse, the Marquis Monaldeschi. In 1660 her successor on the Swedish throne died, and she thereupon repaired to Sweden to claim it for herself; but her conversion to the Roman

Catholic Church proved a bar to her resumption of the crown, and she was compelled to return to Rome in 1668, where she died in 1689.

CHRISTMAS, the festival of the Nativity of Christ observed by the Christian Church yearly on the 25th of December. Augustine considered the festivals, Good Friday, Easter Sunday, Ascension Day, and Whitsuntide, as the only festivals which had an Apostolic origin and the sanction of a general council. Christmas he deemed to be of later origin and lesser authority. When the first efforts were made to fix the period of the year when the advent took place, there were, as we learn from Clement of Alexandria, advocates for the 20th of May and for the 20th or 21st of April. The Oriental Christians generally were of opinion that both the birth and baptism of Jesus took place on the 6th of January. Julian I., Bishop of Rome from A. D. 337-352, contended for the 25th of December, a view to which the Eastern Church ultimately came round, while the Church of the West adopted from their brethren in the East the view that the baptism was on the 6th of January. When the festival was at length placed in December, it afforded a substitute to the various nations who had observed a festival of rejoicing that the shortest day of the year had passed, besides spanning over the great interval between Whitsuntide of one year and Good Friday of the next. Coming to the Roman Christian converts, in lieu of the saturnalia, to which they had been accustomed while yet they were heathens, its purity became sullied almost at the first by revelry which had crept into it from this source. Similarly the Yule log, the mistletoe, etc., among English-speaking peoples, are relics of Druidism. See **CHRISTIAN ERA**.

CHRISTMAS ISLAND, a British island in the Pacific in $1^{\circ} 57' N.$ lat., and $157^{\circ} 27' W.$ long., with some guano deposits. It was discovered by Cook, December, 1777. Another Christmas Island, annexed to Great Britain in 1888, lies about 250 miles S. W. of Java ($11^{\circ} S.$, $105^{\circ} 30' E.$), is 6 miles long by 4 broad, partly volcanic, partly coralline in structure, with rich phosphate deposits (worked since 1897). There is a third Christmas Island off Cape Breton.

CHRISTMAS-ROSE, a plant, *Helleborus niger*, order *Ranunculaceæ*, so called from its flowering at Christmas; also called Christmas flower.

CHRISTOLOGY, that branch of the study of divinity which deals directly with the doctrine of the person of Christ.

CHRISTOPHE, HENRI, a King of Haiti, was an African slave; born in Grenada, West Indies, in 1767, he received his freedom as a reward of faithful service. On the outbreak of the negro insurrection in 1801, he became one of its leaders, and attracted by his energy and ability the attention of Toussaint l'Ouverture, who conferred upon him a divisional military command. After the deposition of Toussaint, Christophe served under his successor, Dessalines, and waged a war of increasing ferocity against the French, who, in 1803, were compelled to evacuate the island. In 1811, Christophe obtained undisputed possession of a portion of the island with the title of King of Haiti. His reign was that of a sanguinary despot, occasioning ultimately a successful revolt of his black subjects, whereupon he committed suicide in 1820.

CHRISTOPHER, ST., a Christian martyr who is supposed to have lived in the 3d century A. D. He was a native either of Syria or Palestine, and is believed to have suffered martyrdom by decapitation in the reign of the Roman Emperor Decius. The Roman Catholic Church celebrates his festival on July 25.

CHRISTOPHER'S, ST. (commonly called St. Kitt's), a British island in the West Indies, one of the Leeward Islands, 23 miles in length, and in general about 5 in breadth; area, 68 square miles. The principal products are sugar, cotton, and rum. The interior consists of many rugged precipices and barren mountains. Of these the loftiest is Mount Misery (evidently an extinguished volcano), 4,100 feet high. The chief town, a seaport with open roadstead, is Basse-Terre (pop. about 8,500). The island has a legislature of its own, with an executive subordinate to the governor of the Leeward Islands, resident in Antigua. It was discovered by Columbus in 1493 and colonized by the English in 1623. Pop. about 30,000.

CHRIST'S COLLEGE, a college in Cambridge, England, founded in 1506. It has about 200 undergraduates, 15 fellowships, and 30 scholarships.

CHRISTY, HOWARD CHANDLER, an American illustrator; born in Morgan co., O., Jan. 10, 1873. He achieved a reputation as an illustrator in newspaper and magazines. He was with the Rough Riders in Cuba and saw fighting before Santiago. He received medals at the Paris Exposition, the Chicago Exposition, and the National Academy of Design.

CHROMATICS, the science of colors; that part of optics which treats of the

properties of the colors of light and of natural bodies.

CHROMITE, a metal used extensively as an alloy to harden steel. It was extensively employed during the war in the manufacture of munitions. The production of chromite in 1919 in the United States was 3,900 long tons, valued at \$87,000. There were imported 61,404 tons, valued at \$1,381,497. The apparent consumption was 65,304 long tons. The chief sources of supply are the United States, Canada, British South Africa, New Caledonia, and India.

CHROMIUM (or CHROME) STEEL, steel in which the carbon is replaced by the metal chromium. This steel can sustain a greater degree of heat than ordinary steel, and consequently will not so easily become oxidized or "burnt" in working and is rolled more easily.

CHROMO-LITHOGRAPHY, the art of printing chromo-lithographs. See LITHOGRAPHY.

CHROMOSPHERE, the gaseous envelope of the sun, through which the light of the photosphere passes. Stellar chromosphere is the gaseous envelope supposed to exist round each star.

CHRONICLE, a historical account of facts or events disposed chronologically or in the order of time. Most of the historians of the Middle Ages were chroniclers who set down the events which happened within the range of their information, according to the succession of years.

In Scriptures, the name of two books, consisting of an abridgment of sacred history from its commencement down to the return of the Jews from the Babylonian captivity, and called by the Septuagint παραλειπόμενα (lit., things omitted), because they contain many supplemental relations omitted in the other historical books.

CHRONOLOGY, the doctrine of science of time, or of computing dates: the method of ascertaining the true periods, or years, when past events took place, and arranging them in their proper order, according to their dates.

CHRONOMETER any instrument that measures time, as a clock, watch, or dial; but, specifically, this term is applied to those time-keepers which are used for determining the longitude at sea, or for any other purpose where an accurate measure of time is required, with great portability in the instrument. The chronometer differs from the ordinary watch in the principle of its escapement, which is so constructed that the balance

is free from the wheels during the greater part of its vibration, and also in being fitted with a "compensation adjustment," calculated to prevent the expansion and contraction of the metal by the action of heat and cold from affecting its movements. Marine chronometers generally beat half-seconds, and are hung in gimbals in boxes 6 or 8 inches square. The pocket chronometer does not differ in appearance from a watch except that it is somewhat larger.

CHRYSANTHEMUM, a genus of herbaceous or slightly shrubby plants, belonging to the *corymbiferous* group of the order *Compositæ*. The family is represented in the United States by the well-known ox-eye daisy, *Chrysanthemum leucanthemum*, and the corn marigold, *C. Segetum*, besides which many varieties have been introduced from other countries and are cultivated here. *C. Sinense* is the plant commonly known as the Chrysanthemum, and so much prized for its flowering in November and December.

CHRYSOLITE, a green-colored orthorhombic magnesium-iron silicate of a vitreous luster, transparent or translucent. It is generally divided into two classes: Precious: Of a pale yellowish-green color and transparent, so as to be fit for jewelry. This is found in the Levant. Common: Dark yellowish-green to olive, or bottle-glass green; common in basalt and lavas, at times in large masses, having a rectangular outline. The *chrysolithus* of Pliny was probably our topaz, and his topaz our Chrysolite. It frequently changes color, becoming brownish or reddish-brown through the oxidation of the iron.

CHRYSOSTOM, JOHN, ST. ("golden-mouthed"), a celebrated Greek father of the church; born in Antioch about A. D. 344. Secundus, his father, who had the command of the imperial troops in Syria, died soon after the birth of his son, whose early education devolved upon Anthusa, his mother. Chrysostom studied eloquence with Libanius, the most famous orator of his time, and soon excelled his master. After having studied philosophy with Andragathius he devoted himself to the Holy Scriptures, and determined upon quitting the world and consecrating his life to God in the deserts of Syria. He spent several years in solitary retirement, studying and meditating with a view to the church. Having completed his voluntary probation he returned to Antioch in 381, when he was appointed deacon by the Bishop of Antioch, and in 386 consecrated priest. He was chosen vicar by the same dignitary,

and commissioned to preach the Word of God to the people. He became so celebrated for the eloquence of his preaching that the Emperor Arcadius determined, in 397, to place him in the archiepiscopal see of Constantinople.

He now exerted himself so zealously in repressing heresy, paganism, and immorality, and in enforcing the obligations of monarchism, that he raised up many enemies, and Theophilus, patriarch of Alexandria, aided and encouraged by the Empress Eudoxia, caused him to be deposed at a synod held at Chalcedon. The emperor banished him from Constantinople, and Chrysostom purposed retiring to Bithynia; but the people threatened a revolt. In the following night an earthquake gave general alarm. In this dilemma Arcadius recalled his orders, and Eudoxia herself invited Chrysostom to return. The people accompanied him triumphantly to the city, his enemies fled, and peace was restored, but only for a short time. A feast given by the empress on the consecration of a statue, and attended with many heathen ceremonies, roused the zeal of the archbishop, who publicly proclaimed against it; and Eudoxia, violently incensed, recalled the prelates devoted to her will, and Chrysostom was condemned and exiled to Armenia. Here he continued to exert his pious zeal until the emperor ordered him to be conveyed to a town on the most distant shore of the Black Sea. The officers who had him in charge obliged the old man to perform his journey on foot, and he died at Comana, in Pontus, 407. Here he was buried; but in 438 his body was conveyed solemnly to Constantinople, and there interred in the Church of the Apostles, in the sepulcher of the emperor. At a later period his remains were placed in the Vatican at Rome. The Greek Church celebrates his feast on Nov. 18, the Roman on Jan. 27. His works, which consist of sermons, commentaries, and treatises, abound with information as to the manners and characteristics of his age.

CHUBUT, or **CHUPAT**, a region in Patagonia, Argentina, so named from a river which drains a large part of its area. Its principal interest lies in its Welsh settlement, which has remained almost wholly Welsh-speaking. The first settlers, 151, arrived in July, 1865. Epochs in its history have been the abandonment of the colony in 1867; the subsequent return from New Bay; a 20 months' nearly complete isolation from the outer world, terminated in 1871. The principal town is Trerawson, or Rawsonville (pop. about 500), about 5 miles from the sea. Petroleum has been

found in the southern part. Area, about 93,000 square miles; pop., about 15,000.

CHUCK-WILL'S-WIDOW, a popular name for a bird of the goat-sucker family, *Antrostomus carolinensis*, so called from its cry.

CHU-KIANG, or **CANTON RIVER**, the "Pearl river" of the Chinese, is the lower part of the Pekiang, and has a navigable channel of about 300 miles. Opposite Canton it is about $\frac{1}{4}$ mile wide, and is crowded with shipping up to 1,000 tons' burden; larger vessels must tie up at Whampoa, 15 miles below. About 40 miles below Canton it is called "Boca Tigris."

CHUNG-KING, a Chinese port in Szechuen, on the Yang-tze-Kiang, at the junction of the Pei river. It was declared open in 1890, and has become the trade center for west China. Pop. about 500,000.

CHUQUISACA (chö-kē-sa'ka), or **SUCRE**, a city of South America, the former capital of Bolivia; well situated on a plateau between the Amazon and La Plata rivers, 9,343 feet above sea-level. It has a cathedral and a university and is the seat of an archbishop. It was founded by one of Pizarro's officers in 1539. Pop. about 30,000. The province of Chuquisaca has an area of 36,132 square miles; pop. about 350,000.

CHURCH, FREDERICK EDWIN, an American landscape-painter; born in Hartford, Conn., May 4, 1826; was a pupil of Thomas Cole. His earliest productions were views of the Catskill Mountains, among which he resided, and a view of East Rock, near New Haven, which attracted very favorable notice. In 1855 he visited South America, and found in the magnificent scenery of that country materials for several of his most admired pictures. After his return he executed his "View of Niagara Falls from the Canadian Shore," regarded by many as the most successful representation of the great cataract. He died in New York City, April 7, 1900.

CHURCH, FREDERICK STUART, an American artist; born in Grand Rapids, Mich., in 1842. He studied at the National Academy of Design, and in 1885 became a member thereof. He has achieved note as a painter of figures and animals.

CHURCH, WILLIAM CONANT, an American journalist; born in Rochester, N. Y., Aug. 11, 1836. He became the publisher of the New York "Sun" in 1860. He fought in the Civil War and, after having been wounded, reached the

rank of lieutenant-colonel of volunteers. In conjunction with his brother Francis he established the "Army and Navy Journal" (1863), and the "Galaxy" magazine (1866), was a contributor to the "Century" and other periodicals, and wrote a notable biography of General Grant. He was a founder and the first president of The National Rifle Association. He died in New York in 1907.

CHURCH GOVERNMENT, the regulation and ordering of spiritual matters, or those pertaining to the discipline and work of the Church.

CHURCH HISTORY, the history of any church, but especially of the Christian Church. See **CHRISTIAN CHURCH, THE**.

CHURCHILL, CHARLES, an English satirical poet; born in Westminster, in February, 1731. He won his fame with "The Rosciad," a satire upon the actors of the time, in which only Garrick and some few popular actresses are praised. His capacity for ridicule was so great that "The Ghost," "The Farewell," "The Conference," "The Author," and "The Prophecy of Famine," proved exceedingly popular. He is almost without a peer in his special field. He died in Boulogne, Nov. 4, 1764.

CHURCHILL, JOHN, Duke of Marlborough. See **MARLBOROUGH**.

CHURCHILL, MARLBOROUGH, an American soldier, born in Andover, Mass., in 1878. He graduated from Harvard University in 1900. In 1901 he was appointed 2d lieutenant of the Artillery Corps. He became captain in 1911 and major in 1917. In the same year he was appointed lieutenant-colonel of the National Army. He was promoted to be brigadier-general of the National Army in August of the same year. From 1912 to 1914 he was instructor at the School of Fire for Field Artillery. He served as military observer with the French armies in the field, in 1916-1917, and from April to June of the same year was executive officer of the American Military Mission to Paris. He became a member of the general staff of the A. E. F. and director of military service. He was acting chief of staff of the Army Artillery of the 1st Army, in 1918. He returned to the United States in June of the same year and was appointed chief of the military intelligence bureau, and assistant chief of staff and director of military intelligence. In 1918-1919 he was on special duty with the American Peace Commission. He received the Distinguished Service Cross and decorations from France and Belgium.

CHURCHILL, RANDOLPH HENRY SPENCER, LORD, second son of the sixth Duke of Marlborough; born Feb. 13, 1849. Having entered Parliament in 1874, by 1884 he had risen to the position of a recognized leader of the Conservative party, and in 1885 became Indian secretary in Lord Salisbury's government. On the defeat of Gladstone's Irish Bill in 1886 Churchill became leader of the House of Commons and Chancellor of the Exchequer, posts which he unexpectedly resigned in December, 1886. He died in London, Jan. 24, 1895.

CHURCHILL, WINSTON, an American author; born in St. Louis, Mo., Nov. 10, 1871. He was graduated from the United States Naval Academy in 1894, and became an editor of the "Army and Navy Journal" the same year. After serving as managing editor of the "Cosmopolitan" magazine, he turned his attention to fiction, achieving great success with his novels "The Celebrity," "Richard Carvel," "The Crisis," "The Crossing," "Coniston," "Mrs. Crewe's Career," "The Inside of the Cup," "A Far Country," and "The Dwelling Place of Light."

CHURCHILL, RT. HON. WINSTON LEONARD SPENCER, an English statesman, born at London, Nov. 30, 1874, son of Lord Randolph Churchill. He was



WINSTON L. S. CHURCHILL

educated at Eton and Sandhurst, and entered the army in 1895. He was correspondent with the Spanish forces in

Cuba, and afterward served in India in the Malakand and Tirah campaigns of 1898, besides being present at the battle of Omdurman on the Nile the same year. In the Boer War he acted as correspondent for the "Morning Post," and was taken prisoner, but escaped from Pretoria. He was present at Spion Kop, the relief of Ladysmith, and the capture of Pretoria. In 1900 he was elected Conservative Member for Oldham, but soon afterward became a Liberal. In 1906 he was appointed Under Secretary for the Colonies, and in 1908 President of the Board of Trade. In 1910 he became Home Secretary, and in 1911 First Lord of the Admiralty, serving until 1915. In this office incurred considerable criticism because of the fiasco at the Dardanelles and of the sending of British forces to Antwerp. In 1916 he retired temporarily from politics and joined the British troops on the western front. In 1917 he became Minister of Munitions and in 1919 Secretary of State for War and Air. He was the author of "The Malakand Field Force"; "The River War"; "London to Ladysmith"; "Ian Hamilton's March"; "Lord Randolph Churchill"; "My African Journey"; "Liberalism and the Social Problem"; etc.

CHURCHILL RIVER, a river of the northwest Canada, which rises in La Crosse Lake, forms or passes through various lakes or lake-like expansions, the largest being Big or Indian Lake, and enters Hudson Bay after a N. E. course of about 900 miles. It is called also Missinippi or English river.

CHURCHING OF WOMEN, a form of thanksgiving after child-birth, adopted from the Jewish ceremony of purification, and practiced still in the Roman Catholic and Anglican Churches, the latter having a special service in the prayer book.

CHURCH OF GOD, or **CHURCHES OF GOD**, a Christian sect which originated in 1830, in a movement in which John Winebrenner, previously a minister in the German Reformed Church, was most prominent. A new society was organized by him, and others who accepted his views, which took the name of the Church of God. It exists principally in Pennsylvania and the Western States. The government of the Church of God is congregational, with a supervising church council, composed of the preachers in charge, the elders, and deacons. Associations, or conferences of churches, called elderships, meet annually, and a general eldership meets every three years. The Church of God holds the doctrines of the Evangelical

churches, with baptism by immersion only, subsequent to faith; feet-washing; the administration of the Lord's Supper in the evening; all the instrumentalities of revivals; and protests against the traffic in intoxicating drinks. The denomination supports several educational institutions, a publishing house at Harrisburg, Pa., and a number of missionaries in India and in other foreign countries. It has some 500 ministers, about 600 churches, and about 40,000 communicants.

CHURCH, STATES OF THE, or PAPAL STATES, a territory that stretched from the Po to near Naples, and in 1859 had an area of 15,774 square miles and a pop. of 3,000,000. It was divided for administrative purposes into 20 districts, including the Comarca of Rome; six legations, among them those of Bologna and Ravenna; and 13 delegations, including Ancona and Perugia. More general divisions were the Romagna, Umbria, and the March of Ancona. The war of 1859 and the popular vote of 1860 left the Pope only the comarca of Rome, the legation of Velletri, and the delegations of Civita Vecchia, Frosinone, and Viterbo, 4,493 square miles in extent, with a pop. of about 700,000, the rest being united with Italy. The temporal power of the Popes originated in a gift of the exarchate of Ravenna by Pepin to Pope Stephen II., and it reached its greatest extent under Innocent III. (1198-1216). The withdrawal of the French garrison of Rome in 1870 led to the final downfall of the Pope's temporal power, and the restriction of the Pope's jurisdiction within the limits of the Vatican.

CHURUBUSCO, BATTLE OF, fought in Mexico, Aug. 20, 1847. After the battle of Contreras, fought on the same day, Santa Ana, with some 27,000 men, made a stand at this hamlet, on the river Churubusco, 6 miles S. of the City of Mexico, to resist the advance of the United States army under General Scott. Churubusco had the strongly fortified convent of San Pablo and an elevated causeway with a stone bridge across the river. Generals Worth and Pillow attacked and carried the bridge; the convent, after holding out two and one-half hours, yielded to General Twiggs. General Shields, who had been engaged on the right, joined in the pursuit, which extended nearly to the City of Mexico. Of 8,000 United States troops in the two actions there were 139 killed and 926 wounded; the Mexicans lost 4,000 killed and wounded, 3,000 prisoners, 37 guns, many small arms, and much ammunition.

CHUSAN, the principal of the group of islands known as the Chusan Archipelago; lies off the coast of China, about 40 miles N. E. of Ningpo. It has an area of over 230 square miles, and a population of about 250,000; and although mountainous in the center, it is generally fertile, and everywhere carefully cultivated. Ting-hai, the capital, a walled town about 3 miles in circumference, is, from its position on the route between Canton and Peking close to the great ports of Shanghai and Ningpo, a place of both strategic and commercial importance, and its land-locked harbor is a busy shipping center. There are few manufactures, but its carved work and silver wares are in repute, and cordage, matting, and fans are exported. It was taken by the British in 1840, and held till 1841, the close of the war; and in 1860 it was again occupied by an English force. Pop. 30,000 to 40,000. The most remarkable of the surrounding group is the sacred island of Pu-tu, a mile E. of Chusan, covered with Buddhist temples, pagodas, and monasteries, and inhabited by upward of 1,000 monks. The chief monastery is one of the richest in China.

CIBBER, COLLEY, an English dramatist; born in London, Nov. 6, 1671; he was one of the most successful staggers of plays in the history of the theater. His dramatic works—particularly "Love's Last Shift," a farce; "Love Makes a Man"; "She Would and She Would Not," and "The Careless Husband," comedies—are masterpieces of construction, although their literary qualities are not up to the high level one might expect. He portrayed the fop, however, with an infinite felicity; and not a few of his scenes are unexampled as specimens of effective action unmarred by meaningless detail. He died in London, Dec. 12, 1757.

CIBITU, a southern island of the Philippine group, 14 miles long and 2 miles wide. It is flat, with a conical mountain in the center, 500 feet high. It is surrounded by coral reefs, with no anchorage to speak of. It was sold by Spain (with Cagayan) to the United States in 1900, upon payment of \$100,000, having been inadvertently excluded from the terms of the treaty of peace.

CICELY (sis'e-li), a popular name applied to several umbelliferous plants. Sweet Cicely, or sweet Chervil, is *myrrhis odorata*, a plant common in Great Britain and in other parts of Europe. It was formerly used in medicine, and in some parts of Europe is used as an ingredient in soups. Sweet Cicely is found

in North American woods from Canada to Virginia.

CICERO, a city of Illinois, in Cook co. It is a suburb of Chicago. Pop. (1910) 14,557; (1920) 44,995.

CICERO, MARCUS TULLIUS, the greatest Roman orator; born in Arpinum 106 B. C. His family was of equestrian rank and his father, though living in retirement, was a friend of some of the chief public men. He received the best education available, studied philosophy and law, became familiar with Greek literature, and acquired some military knowledge from serving a campaign in the Marsic war. At the age of 25 he came forward as a pleader, and having



CICERO

undertaken the defense of Sextus Roscius, who was accused of parricide, procured his acquittal. He visited Greece 79 B. C., conversed with the philosophers of all the schools, and profited by the instruction of the masters of oratory. Here he formed that close friendship with Atticus of which his letters furnish such interesting evidence. He also made a tour in Asia Minor and remained some time at Rhodes, where he visited the most dis-

tinguished orators and took part in their exercises. On his return to Rome his displays of eloquence proved the value of his Grecian instruction, and he became one of the most distinguished orators in the forum.

In 75 B. C. he was appointed *quaestor* of Sicily, and behaved with such justice that the Sicilians gratefully remembered him and requested that he would conduct their suit against their governor Verres. He appeared against this powerful robber, and the crimes of Verres were painted in the liveliest colors in his immortal speeches. Seven of the *Verrine* orations are preserved, but only two of them were delivered, and Verres went into voluntary exile. After this suit Cicero was elected to the office of *aedile*, 70 B. C., became *praetor* in 67, and *consul* in 63. It was now that he succeeded in defeating the conspiracy of *CATILINE* (*q. v.*), after whose fall he received greater honors than had ever before been bestowed upon a Roman citizen. He was hailed as the savior of the state and the father of his country, and thanksgivings in his name were voted to the gods. But Cicero's fortune had now reached the culminating point, and soon was to decline. The Catilinarian conspirators who had been executed had not been sentenced according to law, and Cicero, as chief magistrate, was responsible for the irregularity. Publius Clodius, the tribune of the people, raised such a storm against him that he was obliged to go into exile (58 B. C.) On the fall of the Clodian faction he was recalled to Rome, but he never succeeded in regaining the influence he had once possessed. In 52 B. C. he became *proconsul* of Cilicia, a province which he administered with eminent success. As soon as his term of office had expired he returned to Rome (Jan., 49 B. C.), which was threatened with serious disturbances owing to the rupture between Cæsar and Pompey. He espoused the cause of Pompey, but after the battle of Pharsalia he made his peace with Cæsar, with whom he continued to all appearance friendly, and by whom he was kindly treated, until the assassination of the latter (44 B. C.).

He now hoped to regain his political influence. The conspirators shared with him the honor of an enterprise in which no part had been assigned him; and the less he had contributed to it himself the more anxious was he to justify the deed and pursue the advantages which it offered. Antony having taken Cæsar's place, Cicero composed those admirable orations against him, delivered in 43 B. C., which are known to us by the name of *Philippics* (after the speeches of Demosthenes against Philip of Macedon).

His implacable enmity toward Antony induced him to favor young Octavianus, who professed to entertain the most friendly feelings toward him. Octavianus, however, having possessed himself of the consulate, and formed an alliance with Antony and Lepidus, Cicero was proscribed. In endeavoring to escape from Tusculum, where he was living when the news of the proscription arrived, he was overtaken and murdered by a party of soldiers 43 B. C.; and his head and hands were publicly exhibited in the forum at Rome.

Cicero's eloquence has always remained a model. After the revival of learning he was the most admired of the ancient writers; and the purity and elegance of his style will always place him in the first rank of Roman classics. His works, which are very numerous, consist of orations; philosophical, rhetorical, and moral treatises; and letters to Atticus and other friends. The life of Cicero was written by Plutarch, and there are modern lives by Middleton, Forsyth, and others.

CICERONE, a guide to point out objects of interest to strangers.

CID CAMPEADOR, THE (real name Don Rodrigo Diaz de Bivar), the national hero of Spain; was born in Burgos about 1040. The facts of his career have been wrapped by his admiring countrymen in such a haze of glorifying myths that it is scarcely possible to detect them. His life, however, appears to have been entirely spent in fierce warfare with the Moors, then masters of a great part of Spain. His exploits are set forth in a special chronicle, and in a poem of considerable interest, written not long after his death. His last achievement was the capture of Valencia, where he died in 1099. His exploits are celebrated in a Spanish poem supposed to have been published in the 12th or 13th century, from which Corneille has taken the subject of his masterpiece, "*Le Cid*."

CIDER, a fermented liquor made from the expressed juice of apples. The apples are ground and crushed until they are reduced to a pulp, the juice is allowed to run into casks, where it is freely exposed to the air until fermentation takes place, when a clear liquor of a pale-brown or amber color is the result. Worcester, Hereford, and Devon are the great cider-producing counties of England. In France, Germany, and other countries, and particularly in North America, it is also largely made. It contains from 4 or 5 to 10 per cent. of alcohol, and is intoxicating if drunk in quantities.

CIENFUEGOS (thē-en-fwā'gōs), a port and city of Cuba, on the S. coast,

at the mouth of Iagua bay, about 200 miles from Havana. Cienfuegos is the center of the Cuban sugar trade, and is connected by rail with Havana. There are soap and ice plants and cacao, molasses, sugar, and tobacco are exported. It has one of the best natural harbors in the world. Pop. about 90,000.

CIGAR, a small roll of manufactured tobacco leaves carefully made up, and intended to be smoked by lighting at one end and drawing the smoke through it. See TOBACCO.

CIGARETTE, a sort of small cigar made by rolling fine-cut tobacco in thin paper specially prepared for the purpose, or in tobacco leaf. See TOBACCO.

CILICIA, an ancient division of Asia Minor, now included in the Turkish province of Adana, which lay between the Taurus range and the Cilician sea, while the Amanus range separated it from Syria. The E. portion of Cilicia was fertile in grain, wine, etc.; the W. and more mountainous portion furnished inexhaustible supplies of timber to the ancients. The pass called by the Turks Gölek Boghaz (anciently *Pylæ Ciliciæ*) is that by which Alexander the Great entered Cilicia. In early ages Cilicia was ruled by its own kings; the people, who were probably akin to Syrians and Phœnicians, being notorious pirates. The country fell successively under Persian, Macedonian, and Syrian rule, and was made a Roman province by Pompey in 67 B. C.

CIMABUE, GIOVANNI (chē-mä-bö'ā), a distinguished Florentine painter; born about 1240. Very little is known of his life, but he is said to have been a disciple of Giunta of Pisa; and he was one of the earliest painters who left off copying the hard and unnatural drawing of the Byzantine school, studied nature for himself, and contributed powerfully to the revival of art. The colossal "Madonna," which he painted for the Rucellai Chapel, in the Church of Santa Maria Novella, Florence, is said to have excited extraordinary enthusiasm, and to have been carried in procession to the church, where it still remains. It was Cimabue who first discovered the genius of Giotto. He died about 1302.

CIMMERII, OR CIMMERIANS, an ancient nomadic race, inhabiting the Crimea, and parts of the neighboring country, having been expelled by the Scythians, passed along the shores of the Euxine, invaded Asia Minor, and pillaged Sardis, the capital of Lydia, 635 B. C. In that country they were said to have remained until about 617 B. C., when

they were defeated and driven out of Asia Minor. Homer refers to another people of the same name, fabled to have dwelt in a land of perpetual darkness. Hence the term "Cimmerian gloom."

CIMOLITE, a light gray, white, or reddish silicate of alumina, occurring sometimes massive, or of a slaty texture. It is very soft. It occurs at Argentiera; also at Nagpore, central India, and in some parts of Russia. The Nagpore specimens have been called also Hunterite.

CIMON, an ancient Athenian general and statesman, was a son of the great Miltiades. He fought against the Persians in the battle of Salamis (480 B. C.), and shared with Aristides the chief command of the fleet sent to Asia to deliver the Greek colonies from the Persian yoke. The return of Aristides to Athens soon after left Cimon at the head of the whole naval force of Greece. He distinguished himself by his achievements in Thrace, having defeated the Persians by the Strymon, and made himself master of the country. He conquered the pirate-island of Scyros, subdued all the cities on the coast of Asia Minor, pursued the Persian fleet up the Eurymedon, destroyed more than 200 of their ships, and then, having landed, on the same day entirely defeated their army (469 B. C.). He employed the spoil which he had taken in the embellishment of Athens, and in 463 reduced the revolted Thasians; but the popular leaders, beginning to fear his power, charged him on his return with having been corrupted by the King of Macedon. The charge was dropped, but when Cimon's policy of friendship to the Lacedæmonians ended in the latter insulting the troops sent by Athens to their aid, his opponents secured his banishment. He retired into Boeotia, and his request to be allowed to fight with the Athenians against the Lacedæmonians in 457 at Tanagra was refused by the suspicious generals. Eventually Cimon was recalled at the instance of Pericles to conclude a peace with Lacedæmon. He died shortly after, in 449, while besieging Citium in Cyprus.

CINCHONA, a genus of trees found exclusively on the Andes in Peru, and adjacent countries, producing a medicinal bark of great value known as Peruvian bark, Jesuit's bark, etc. The Jesuits introduced it into Europe. There are many species of the genus.

CINCHONA BARK, the bark of several species of *cinchonaceæ*, used in medicine, or for the extraction of the alkaloids, quinine, cinchonine, etc., which they

contain. The following are the most important: *C. flava cortex*, yellow cinchona bark, which occurs as quills covered with a brown epidermis, mottled with whitish yellow lichens, and also in flat cinnamon-colored pieces. Yellow bark is rich in quinine. It is derived from *C. calisaya*, which grows in the peculiar cloudy regions of the Andes. *C. pallidæ cortex*, pale cinchona bark, from *C. condaminea*. It occurs always in quills, covered with crustaceous lichens. It contains chiefly cinchonine. *C. rubræ cortex*, red cinchona bark, the bark of *C. succirubra*. This species appears to thrive in India. It occurs in flattened rough-fibrous, dark-brown red pieces, which are covered with a brown-red epidermis. It contains about equal quantities of cinchonine and quinine. The yellow bark is used in the form of decoction, extract, infusion, and tincture. The pale bark is contained in *tinctura cinchonæ composita* and in *mixtura ferri aromatica*. The cinchona barks contain, besides the alkaloids, also certain acids having astringent properties, and are valuable as tonics in cases of great debility. Cinchona barks rich in quinine generally contain much lime, and their solutions are precipitated by sodium sulphate.

CINCINNATI, a city and county-seat of Hamilton co., O.; the second city in the State in population and the sixteenth in the United States, according to the census of 1920. It is built on the N. shore of the Ohio river, directly opposite Covington, Ky., is known as the "Queen City of the West"; and is connected with the Kentucky shore by five bridges; area, 35 $\frac{1}{4}$ square miles; pop. (1890) 296,908; (1900) 325,902; (1910) 363,463; (1920) 401,247.

Cincinnati occupies two plateaux, 400 by 500 feet above sea-level, surrounded by a semi-circular chain of hills. The surface slopes from the water-front to some points where it reaches an extreme altitude of 900 feet. The highland portions are cut by deep ravines, adding much to the beauty of the city, and commanding interesting views of the surrounding country. The streets in the older portion of the city cross each other at right angles and average 65 feet in width, and those in the modern section are arranged according to the surface conditions. The buildings are mostly of freestone, brick, and bluestone, found within or near the city.

Cincinnati is served by 19 railroads—a greater number than any other city along the Ohio river. It is the northern terminus of the Louisville and Nashville railroad and the Cincinnati Southern

railway, now operated as a part of the Southern railway system, and other railroads serving northern territory. It is one of the important junction points of the Baltimore & Ohio, the Chesapeake & Ohio, and other railroads, connecting the South with New York, Philadelphia, and other eastern seaports, and south-eastern seaports. It is also a terminal of the railroads which carry the bulk of the trade from the North Central States to the South. The average daily inbound tonnage in Cincinnati is 105,000 tons, and the average daily outbound is 100,000. 110 inbound freight trains reach the city daily, and 112 leave the city. 154 passenger trains daily reach the city, and 140 leave it. Cincinnati is the only city in the United States owning a steam railroad, the Cincinnati Southern, which is 338 miles long, extending through Kentucky and Tennessee to Chattanooga. It is now operated as a part of the Southern railway system. The Cincinnati Southern brings a large revenue to the city, and provides prompt and adequate service to the entire South. There is one street railway system for the entire city. It has 230 miles of track. The company has about 3,000 employees. The average daily car mileage is 70,000, and approximately 160,000,000 passengers are carried annually.

Cincinnati is the most southern northern city and the most northern southern city in the United States. This combination causes several peculiarities, which give the city a noteworthy individuality. One of the distinctive features of Cincinnati is its origin in a great number of independent communities or villages, each occupying its own hill top or valley, and separated from its neighbors by topographical conditions peculiar to the locality. Several dozen of the former villages are now a part of the city, including Clifton, Mt. Auburn, Walnut Hills, Price Hill, Westwood, Hyde Park, Evanston, Pleasant Ridge, Cumminsville, Brighton, Columbia, and others. An inheritance from this condition of separate communities is the large number—about 40 or more—of local improvement associations which formulate and express public opinion. Cincinnati is distinctly American. In Cincinnati proper the proportion of foreign born to native born is smaller than for any other large American city. Practically 80 per cent. of the population is native born. Cincinnati is also the only large American city in which the percentage of foreign born has tended to decrease. It is a city of beautiful homes and stately buildings. St. Peter's Cathedral is one of the most picturesque and beautiful structures in

The Western States. There are also St. Francis de Sales Church, Rockdale Temple (Jewish), the new Court House, and the most imposing of Cincinnati buildings, the Union Central. The City Hall is constructed of granite and Amherst stone. The tower is 32 feet square and 250 feet high. The Government Building and Custom House is a magnificent granite structure costing over \$6,000,000.

The Cincinnati May Festivals are probably the most notable musical meetings in the United States. The biennial May Festival began its work in 1873. The wonderful artistic and financial success of that festival, and the one held in 1875, suggested the need of a permanent music hall for Cincinnati. This contains one of the dozen gigantic organs of the world. Cincinnati Music Hall is a public institution—a gift to the city under the control of a self-perpetuating and incorporated organization of citizens. The seating capacity is 3,600, and the stage is 112 feet wide and 70 feet deep—one of the largest in the United States. The Zoological Garden covers over 63 acres of ground. Its collection of wild animals is one of the largest in the world, and it is noted for its scenic beauty.

The work of the Department of Health is carried on under seven main divisions: Administration, Medical Inspection, Sanitary Inspection, Food Inspection, Laboratory, Tuberculosis Dispensary, Vital Statistics. Cincinnati has nearly 3,000 manufacturing establishments. The principal products are: machine tools, soap, men's and women's clothing, boots and shoes, printing and publishing, slaughtering and packing, furniture, leather, rolling mill products, special machinery, sheet metal products, foundry products, printing inks, wood-working machinery, lumber and timber products, electrical machinery, wagons, musical instruments, and chemicals. The capital employed is about \$212,000,000 and the annual factory output exceeds \$300,000,000. Cincinnati is the banking center for a vast area of thriving territory. Within the municipal limits there are eight National banks, 33 State banks, and 221 building and loan associations. In 1919 the bank clearings were \$3,130,811,300. There are several imposing bank structures in Cincinnati, among them being the enormous building of the First National Bank, and the splendid structures of the Second National Bank, the Fifty-third National Bank, the Provident Savings Bank & Trust Co., and the Union Trust & Savings Bank.

The city has about 290 church organi-

zations, including 219 Protestant and 56 Catholic. There are 12 Jewish synagogues. The city is the seat of a Roman Catholic Archbishop and a Protestant Episcopal Bishop. There are over 60 benevolent and welfare organizations and 17 hospitals, besides numerous denominational and non-sectarian homes. The public school system is thoroughly modern and well organized. There are 83 schools with over 1,800 teachers. Higher education is provided by the UNIVERSITY OF CINCINNATI (*q. v.*) and the Ohio Mechanics Institute, besides many academic and professional schools, devoted to surgery, theology, law, dentistry, art, and music. There are 17 public libraries, the Free Public Library containing over 500,000 volumes and pamphlets.

The parochial school system includes several high schools, and a well-equipped college. The total Catholic population of Cincinnati is 93,879. Catholic parochial schools number 56, with an enrollment of 16,603. There is one theological seminary, a college for young men, four Catholic high schools for young men and women, one law school, one school for commerce, accounting, and sociology, nine academies for young ladies, and one college for young ladies. The professional schools include the Eclectic Medical College, Ohio College of Dental Surgery, Cincinnati Law School, Lane Theological Seminary, Hebrew Union College, College of Music, and the Conservatory of Music. On College Hill is the Ohio Military Institute, a private undertaking developed from the old Ohio Farmers' College. It furnishes academic and military training. Other private schools are the University School, Franklin School for Boys, Oakhurst, Bartholomew-Clifton School for Girls, various schools of expression, and business schools. The Children's Home, Cincinnati Orphan Asylum, Bethany Home, German Protestant Orphan Asylum, Jewish Foster Home, and the St. Joseph Orphan Asylum are some of the child-caring institutions for the placing of homeless and destitute ones who have been committed to their care.

The government of Cincinnati is based upon a charter, adopted in November, 1917, by referendum vote. In general, the charter provides for a city council, six of the members elected from the city as a whole, and 26 from the 26 wards of the city. The charter also provides for the election of a mayor, who is more or less independent of the council.

The present total property tax rate (including city, schools, county, library, state, and city levies) is a fraction over

\$15 per \$1,000 valuation. Property is assessed at 100 per cent. valuation. The net funded debt of the city (less sinking fund) is \$59,723,087. The total assessed realty valuation is \$466,914,880. The budget for 1919 was \$7,236,668. The Cincinnati Water Works are municipally owned. They have a rated capacity of 128,000,000 gallons per day; the daily consumption is in the neighborhood of 60,000,000 gallons. The pressure varies in different places from 40 to 170 pounds. The water works is self-supporting; all its needed revenue is derived from the sale of water, and none from taxes.

Cincinnati, named in honor of the Society of the Cincinnati, was first settled by white men in 1780, and was incorporated as a city in 1819. Mounds containing various relics show that a portion of the site of the city was anciently occupied. The first steamboat descending from Pittsburgh visited the town in 1811; the first railway was opened in 1845; the first Roman Catholic bishop was consecrated in 1822; and the city has been an archiepiscopal see since 1850.

CINCINNATI, a society or order in the United States, established by the officers of the Revolutionary army in 1783, "to perpetuate their friendship, and to raise a fund for relieving the widows and orphans of those who had fallen during the war." It was so named because it included patriots, headed by Washington, who in many instances had left rural affairs to serve their country (see **CINCINNATUS**). The badge of the society is a bald eagle suspended by a dark-blue ribbon with white borders, symbolizing the union of France and the United States. On the breast of the eagle there is a figure of Cincinnatus receiving the military ensigns from the senators, round the whole are the words "Omnia relinquunt servare rempublicam." As this distinction was made hereditary, it was attacked as opposed to republican equality. Franklin saw in it the germ of a future aristocracy; and at a meeting held in Philadelphia in 1784 several changes were made in the constitution of the society, the right of succession being made conditional on approval in each case by the society. Membership descends to the eldest lineal male descendant, if judged worthy, and, in failure of direct male descent, to male descendants through intervening female descendants. The general society is composed of the general officers and five delegates from each State society, and meets triennially. In 1854 it ruled that proper descendants of Revolutionary officers who were entitled to original member-

ship, but who never could avail themselves of it, are qualified for hereditary membership, if found worthy, on due application. There are about 1,000 living members. President, Winslow Warren.

CINCINNATI, UNIVERSITY OF, a coeducational institution for higher education at Cincinnati, O. It is a municipal university, maintained by the city. There are about 3,000 students and 350 members of the faculty. The university was founded in 1871. President, Charles William Dabney, Ph. D., W. L. D.

CINCINNATUS, LUCIUS QUINTIUS, a wealthy patrician in the early days of the Roman Republic, born about 519 B. C. He succeeded Publicola in the consulship, and then retired to cultivate his small estate beyond the Tiber. The messengers of the senate found him at work on his farm when they came to summon him to the dictatorship. He rescued the army from its peril, and then returned quietly to his farm. At the age of 80 he was again appointed dictator to oppose the ambitious designs of Spurius Mælius.

CINDERELLA (*little cinder girl*), the heroine of a popular fairy tale. She is the drudge of the house, dirty with housework, while her elder sisters go to fine balls. At length a fairy enables her to go to the prince's ball; the prince falls in love with her, and she is discovered by means of a glass slipper which she drops, and which will fit no foot but her own. The glass slipper is a strange mistranslation of *pantoufle en vair* (*a fur slipper*), not *en verre*.

CINEMATOGRAPH, an instrument designed to picture persons and things while in motion. The invention is to be credited to two brothers, Lumière of Lyons, France. The principle on which it is founded is the same as that of Edison's kinetoscope, namely, the persistence of vision. The device consists of a photographing band or film about an inch and a quarter wide, and with a minimum length of 50 feet. This is exposed in a cinematograph. The band is wound around a drum and passes from this to a series of compensating drums into a position behind the lense of the camera. The shutter of this lense opens sixteen times a second for a period of perhaps one-hundredth of a second. In the intervals of the shutter being closed the film is pulled forward for about three-quarters of an inch for a second exposure, and so on. The mechanism is usually worked by a crank which turns at a rate of twice a second. After the exposure the film is developed and wound upon a large drum. To produce positives from these

negatives a second film is exposed beneath it and is in turn developed.

The instrument itself is a projecting lantern which throws the pictures upon the screen in rapid succession. The speed with which the pictures are shown is usually at the rate of sixteen per second. Of course, the picture is not strictly continuous, but the interval is so slight between the showing of one picture and the next that the eye fails to notice it, and the effect produced is that of continuity. The movement of the successive pictures is usually operated by hand, but in some cases a small electric motor is attached which operates automatically. The former method is preferable when skillfully done, because there may be cases when the effect of the picture is increased by dwelling a trifle longer on one part than on the other. The film commonly used in exhibitions ranges from 200 to 350 yards. This, at the ordinary rate of speed used, requires from 10 to 16 minutes for presentation on the screen. Of course, any number of reels can be used, depending upon the importance or interest of the picture exhibited. Great care must be taken by the operator against fire, owing to the sensitive nature of the materials used and the concentrated light employed for projecting the picture on the screen. Several automatic inventions have been made that reduce the danger to a minimum. See MOVING PICTURES.

CINNA, LUCIUS CORNELIUS, a Roman patrician, associate of Marius, and leader of the popular party during the absence of Sulla in the E. In 86 B. C. he was elected consul along with Cn. Octavius, and in violation of his oath to Sulla he attempted to overpower the senate, and to procure the recall of Marius and his party from banishment. In the contest which ensued he was defeated by his colleague and driven from the city. His office thus became vacant, and the senate appointed another consul in his stead. He soon returned, however, along with Marius, and laid siege to Rome. The senate were forced to capitulate; but while the votes of the people were being taken for the repeal of the sentence against Marius, he broke into the city, massacred the friends of Sulla, and allowed his partisans to commit frightful excesses. He was consul for the next three years; but Sulla, having brought the Mithridatic war to a close, resolved (84 B. C.) to return to Italy to inflict condign punishment on his enemies. Cinna prepared to resist him by force of arms, but was slain by a mutiny among his own troops. His daughter Cornelia married Julius Cæsar.

CINNAMON, an aromatic substance consisting of the bark of a tree or trees. The Phœnicians, the Arabs, or both, imported the genuine cinnamon into Palestine remotely from Ceylon or the Eastern Archipelago, but probably from some mercantile port much nearer at hand. It was one of the ingredients in the holy anointing oil, which Moses was commanded to make for the anointing of the tabernacle and its furniture (Exod. xxx: 22-29).

CINQ-MARS, HENRI COIFFIER DE RUZÉ (*sank-märs*), MARQUIS DE, a French courtier; born in 1620. At the age of 18 he was presented at court by Cardinal de Richelieu, and soon obtained the favor of Louis XIII., to whom he became Master of the Horse. Chafing at the restraint under which Richelieu held him, and ambitious of political power, he framed a conspiracy to overthrow the cardinal, of which the King himself, and his brother Gaston, Duke d'Orléans, were members. But Louis was weak and fickle, Gaston perfidious, and Richelieu not the man to be put down by a youth just turned of 20. Cinq-Mars was delivered up to the cardinal, and beheaded at Lyons, along with his friend, the councillor De Thou, Sept. 12, 1642. Cinq-Mars is the hero of a historical novel by Alfred de Vigny and of an opera by Gounod.

CINQUE FOIL, the name of a species of the genus *Potentilla*, which have fingered leaves. In architecture, it is an ornamental foliation or feathering, used in the arches of the lights and tracery of windows, panelling, etc.

CINQUE PORTS (Five Ports), the sea-port towns of Dover, Sandwich, Hastings, Hythe, and Romney, England; to which three others were afterward added, viz., Winchelsea and Rye. These towns are incorporated, with peculiar privileges; most of which, however, have been gradually abolished. A Lord Warden, most of whose special privileges have also been abolished, is still appointed and has his residence at Walmer Castle near Deal.

CIPHER WRITING, a method of sending important intelligence in a manner so effectually disguised that only those for whom the news is intended can understand the meaning of what is written. Till comparatively recent years diplomats, statesmen, and military or naval commanders were the principal persons compelled by circumstances to keep their affairs or their intended movements shrouded in secrecy. So long as there was no regular postal service im-

portant letters were sent by courier, and thus the weightiest secrets were often at the mercy of any one inclined to be dishonest.

Hence there came into extensive use the art of writing in cipher, called also cryptography, from two Greek words *κρυπτός*, "secret," and *γράφειν*, "to write." Under this term are included all private alphabets, or systems of characters for the safe transmission of secrets. A figured cipher is one in which the letters of the alphabet are numbered, and these numbers compose the cryptogram. To insure secrecy it is, of course, necessary that the particular series of numbers chosen shall be known only to those who use the cipher. Another plan consists in choosing a certain book—a dictionary appears to have been the favorite—and by a simple citation of the number of the page, of the column, and of the line, sentences were constructed, the key to which was extremely difficult of discovery by one not in the secret.

The opening years of the second half of the 19th century found the world in amazement over the then recent invention of telegraphy. Immediately a new want made itself felt. Secrecy had been sacrificed at the shrine of speed. If the mail was slow, it afforded privacy, but the contents of a telegraphic message are of necessity known to others besides the sender and the receiver. So the diplomat, the banker, and the merchant soon began to send cipher dispatches. It was quickly discovered, however, that existing methods of Cipher Writing were unadapted to telegraphy; the costliness of the new invention necessitated brevity; and thus it was not long before there went whirling over the wire messages of 10 words that, properly deciphered, included from 30 to 50.

A great proportion of commercial messages are similar in their terms, and hence it is that a single word representing three or four words in frequent use is the plan on which our present cable ciphers are based, whereby there is annually a large saving in expense. Then, too, as trade increased and competition became fierce, every firm wanted its own cipher-system, distinct from any used by other houses in the same business; and reflection will enable us to appreciate the vast number of separate ciphers in use in a great commercial center like New York City. Therefore, in course of time, the preparation of cipher systems for merchants and others using the telegraph largely came to be a regular calling.

At one of these offices a person may be accommodated with a code of from 50 to 5,000 words. Most of these codes are alphabetically arranged in parallel columns,

like shipping signals—the English words and phrases in one column, and their cipher equivalents in another.

The cipher codes of the State Department at Washington are frequently changed. The special code is intrusted to the personal custody of diplomatic officials embarking on a mission, who retain possession of it and destroy it if their lives are endangered.

CIRCASSIA, or TCHERKESSIA, a mountainous region in the S. E. of European Russia, lying chiefly on the N. slope of the Caucasus, partly also on the S., and bounded on the W. by the Black Sea. Since the Russian revolution this territory forms part of the republics of Kuban and Georgia. The mountains, of which the culminating heights are those of Mount Elbruz, are intersected everywhere with steep ravines and clothed with thick forests, and the territory is principally drained by the Kuban and its tributaries. Its climate is temperate, its inhabitants healthy and long-lived. The people call themselves Adighé, the name *Tcherkess* (robbers) being of Tartar origin. They are divided into several tribes speaking widely-different dialects.

While they retained their independence their government was of a patriarchal character, but every free Circassian had the right of expressing his opinion in the assemblies. They possessed none but traditional annals and laws. Polygamy was permissible in theory, but not common. The duties of hospitality and vengeance were alike binding, and a Spartan morality existed in the matter of theft. Their religion, which is nominally Moslem, is in many cases a jumble of Christian, Jewish, and heathen traditions and ceremonies. As a race the Circassians are comely, the men being prized by the Russians as warriors, and the women by the Turks as mistresses, a position generally desired by the women themselves.

The early history of Circassia is obscure. Between the 10th and 13th centuries it formed a portion of the empire of Georgia, but in 1424 the Circassians were an independent people, and at war with the Tartars of the Crimea, to whose khans, however, some were occasionally tributary. In 1705 the Tartars were defeated in a decisive battle, but shortly after the territorial encroachments of the Russians on the Caucasian regions began, and in 1829 the country was formally annexed by them. A heroic resistance was made by the Circassians under their leader Schamyl, and on being reduced to submission numbers of the inhabitants emigrated to the Turkish provinces. In the N. and E., however, tribes of the Cir-

cassian stock remain. The Circassians, properly so called, have been estimated variously to number from 150,000 to 500,000.

CIRCE (*ser'sē*), a daughter of Sol and Perse, celebrated for her skill in magic and poisonous herbs. She married a Sarmatian prince of Colchis, whom she murdered to obtain the kingdom, but was expelled by her subjects, and carried, by her father, to an island called *Æa*, on the coast of Italy. Ulysses, on his return from the Trojan war, visited her coast; and all his companions, who ran headlong into pleasure and voluptuousness, were changed by Circe's potions into swine. Ulysses, fortified against all enchantments by an herb called *moly*, which he had received from Mercury, demanded from Circe the restoration of his companions to their former state. She complied, loading the hero with honors; and, for one whole year, he forgot his glory in his devotion to pleasure.

CIRCLE, a plane figure contained by one line, which is called the circumference, and is such that all straight lines drawn from a certain point (the center) within the figure to the circumference are equal to one another. The properties of the circle are investigated in books on geometry and trigonometry. Properly the curve belongs to the class of conic sections, and is a curve of the second order. A great circle of a sphere is one that has its center coinciding with that of the sphere. The celebrated problem of "squaring the circle" is to find a square whose area shall be equal to the area of any given circle. It is not possible to do so. All that can be done is to express approximately the ratio of the length of the circumference of the circle to the diameter, and to deduce the area of the figure from this approximation. If the diameter be called unity, the length of the circumference of the circle is $3.1415926535\dots$; and the area of the circle is found by multiplying this number by the square of the radius. Thus the area of a circle of 2 feet radius is 3.14159×4 , or 12.56636 square feet approximately. For trigonometrical calculations the circumference of the circle is divided into 360 equal parts called degrees, each degree is divided into 60 minutes, and each minute into 60 seconds.

CIRCLEVILLE, a city and county-seat of Pickaway co., O.; on the Scioto river, the Ohio and Erie canal, and the Cincinnati and Muskingum Valley and the Norfolk and Western railroads, 28 miles S. of Columbus. It derives its name from a circular earth work built

by some ancient people, which is the site of the present city. It has strawboard works, canneries, and flour mills, numerous churches, a high school, graded public schools, several daily and weekly newspapers, 3 National banks, etc. Pop (1910) 6,744; (1920) 7,049.

CIRCUIT COURT, a court in the United States next in rank to the United States Supreme Court. In 1920 there were nine circuits, each consisting of several States, and each is allotted to one of the nine justices of the Supreme Court, who must attend at least one term of court in each district of his circuit every two years. Courts may be held at the same time in different districts of the same circuit. These courts formerly had original jurisdiction, concurrently with those of the States, in civil suits in law or equity for more than \$500 between citizens of different States, or where an alien is a party or the United States plaintiff, as well as in revenue cases and some in bankruptcy, and in some criminal cases concerning persons denied citizenship under State laws, or offenses against the United States. Their appellate jurisdiction extended to admiralty and maritime cases, to civil actions referred from the district courts, to patent cases, and some others. Since 1911 these courts, by an act of Congress, have only an appellate jurisdiction. The judges of each circuit and the justices of the Supreme Court for the circuit constitute a Circuit Court of Appeals. The First Circuit consists of Maine, Massachusetts, New Hampshire, Rhode Island, Porto Rico. Second—Connecticut, New York, Vermont. Third—Delaware, New Jersey, Pennsylvania. Fourth—Maryland, North Carolina, South Carolina, Virginia, West Virginia. Fifth—Alabama, Florida, Georgia, Louisiana, Mississippi, Texas, Canal Zone. Sixth—Kentucky, Michigan, Ohio Tennessee. Seventh—Illinois, Indiana, Wisconsin. Eighth—Arkansas, Colorado, Oklahoma, Iowa, Kansas, Minnesota, Missouri, Nebraska, New Mexico, North Dakota, South Dakota, Utah, Wyoming. Ninth—Alaska, Arizona, California, Hawaii, Idaho, Montana, Nevada, Oregon, Washington.

CIRCULAR NOTES. See CREDIT, LETTER OF.

CIRCULAR NUMBERS. numbers whose powers end on the same figure as they do themselves: such are numbers ending in 0, 1, 5, 6.

CIRCULATING LIBRARY. See LIBRARY.

CIRCULATION, in anatomy and physics, the term used to designate the

course of the blood from the heart to the most minute blood-vessels (the capillaries), and from these back to the heart. The heart is situated nearly in the center of the cavity of the chest, or thorax, as it is termed in anatomy, between the lungs, behind the breastbone, or sternum, in front of the vertebral column, and above the diaphragm, on which it obliquely rests. In form it is somewhat conical, the lower end tapering almost to a point, and directed rather forward and to the left. This lower portion alone is movable, and at each contraction of the heart, it is tilted forward, and strikes against the walls of the chest between, in man, the fifth and sixth ribs, or a little below the left nipple.

All the large vessels connected with the heart—the *venæ cavae*, the pulmonary artery and the aorta—arise from its base, and serve, from their attachment to the neighboring parts, to keep that portion of it fixed. Indeed, these vessels may be regarded as suspending the heart in the cavity, which is lined by a smooth serous membrane, which, near the top, is reflected downward over the roots of the great vessels, and covers the whole of the outer surface of the heart. These two smooth serous surfaces—one lining the cavity, the other investing the heart—are kept moist by a fluid which they secrete, and by this arrangement friction may be regarded as reduced to its minimum. The cavity or sac in which the heart lies is called the pericardium.

Since all the arterial blood leaves the heart through the aortic opening, in tracing its course to the different parts of the system we obviously have only to follow the aorta to its final branches. The arteries distribute the arterial blood to the capillaries, which pervade every part of the body. The veins, like the arteries, are found in nearly every tissue; they commence by minute plexuses (an anatomical term for a network-like arrangement), which communicate with the capillaries. Branches from these plexuses uniting together form small venous trunks, which by joining increase in size as they pass onward toward the heart. If we accept certain venous structures (called sinuses) occurring in the interior of the skull, we may divide the veins into two sets—the superficial or cutaneous and the deep veins. The deep veins accompany the arteries, and are usually inclosed in the same sheath of cellular tissue with them. In the case of the smaller arteries, they generally exist in pairs, one on each side of the artery, and are called *venæ comites*, while the larger arteries have usually only one accompanying vein.

The superficial veins occur immediately beneath the integument; they not only return the blood from the skin and adjacent structures, but communicate with the deep veins. All the veins finally unite into two large trunks, termed the superior and inferior vena cava, which open into the right auricle of the heart; the superior vena cava being formed by the union of the veins which return the blood from the head and neck (the jugulars) with those which convey it from the arms (the subclavians), while the inferior vena cava receives the blood from the lower extremities, the trunk, and the abdominal and pelvic viscera. See HEART.

CIRCUMCISION, an operation consisting in removing circularly the prepuce of infants. God commanded Abraham to use circumcision as a sign of his covenant; and in obedience to this order, the patriarch at 99 years of age was circumcised, as also his son Ishmael, and all the males of his household (Gen. xvii: 10-12). God repeated the precept to Moses, and ordered that all who intended to partake of the Paschal sacrifice should receive circumcision, and that this rite should be performed on children on the eighth day after their birth (Ex. xii: 44). The Jews and all the other nations sprung from Abraham, as the Ishmaelites, the Arabians, etc., have always been very exact in observing this ceremony. At the present day it is an essential rite of the Mohammedan religion, and though not enjoined in the Koran, prevails wherever this religion is found. A similar operation is performed among the Egyptians, Arabians, and Persians, on the females. The Jews esteemed uncircumcision as a very great impurity; and the greatest offense they could receive was to be called uncircumcised. Paul frequently mentions the Gentiles under this term, not opprobriously (Rom. ii: 26), but in opposition to the Jews, whom he names "the circumcised."

The feast of circumcision is a festival observed in the Roman Catholic Church and in some other denominations, in commemoration of the circumcision of Jesus Christ. It is held on Jan. 1.

CIRCUMFERENCE, or **PERIPHERY** the curve which incloses a circle, ellipse, oval, cardioid, or other plane figure. In figures bounded by straight lines, as the triangle, square, and polygon, the term perimeter is employed to designate the sum of all the bounding lines taken together. The length of the circumference depends partly on the nature of the curve. See CIRCLE, etc.

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